NETWORK WORLD

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Compaq to air array of SystemPros

By Caryn Gillooly
Senior Editor

HOUSTON — Compaq Computer Corp. this week plans to unveil a new line of aggressively priced SystemPro/LT servers with disk array technology usually reserved for its high-end superserver models.

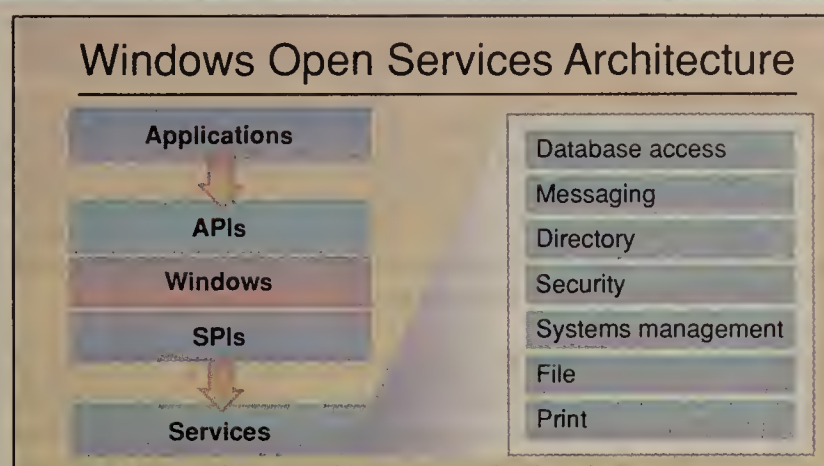
The company will also announce two new low-end models to its existing SystemPro/LT line and said it is considering a plan to bundle major network operating systems onto the servers.

"Our strategy is to leverage software from some of the most popular networking vendors," said Rod Schrock, director of systems product marketing at Compaq, based here.

He added that his company may offer fully configured SystemPro models with Banyan Systems, Inc.'s VINES, Microsoft Corp.'s LAN Manager and Novell, Inc.'s NetWare.

On the hardware side, Compaq will offer three models in its new SystemPro/LT Intelligent Drive Array (IDA) line, a series of single-processor servers that will

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Under Microsoft's new architecture, applications built on a common set of Windows APIs will be able to transparently access a variety of underlying services supporting the company's SPIs.

API = Application program interface
SPI = Service Provider Interface

GRAPHIC BY SUSAN SLATER — SOURCE: MICROSOFT CORP., REDMOND, WASH.

LAN internet community opens up to embrace SNA

By Maureen Molloy
Staff Writer

Paradoxically, the key buzzword today in the LAN internet arena is "SNA."

IBM's recent introduction of a multiprotocol router has even the largest IBM customers thinking about migrating their Systems Network Architecture traffic to router-based local-area network internets ("IBM launches line of SNA-ready routers," *NW,* Jan. 27).

And while they were heading that way already, the leading router vendors are stepping up efforts to take more active roles in IBM environments by improving their SNA support.

"IBM's announcement is a boon to the entire internetworking market because it is effectively telling users that routed internets are a viable platform for SNA traffic," said John McConnell, vice-president and a principal at Infonetics Research, Inc. in Boulder, Colo. "Many users will now look more seriously at the economic advantages that can be

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Net services strategy debuts for Windows

Microsoft unveils architecture with APIs, services to ease networking of Windows workstations.

By Margie Wylie
Senior Editor

TUCSON, Ariz. — Following Henry David Thoreau's timeless urging to "Simplify, simplify," Microsoft Corp. last week consolidated several initiatives into a single strategy for Windows networking now and in the future.

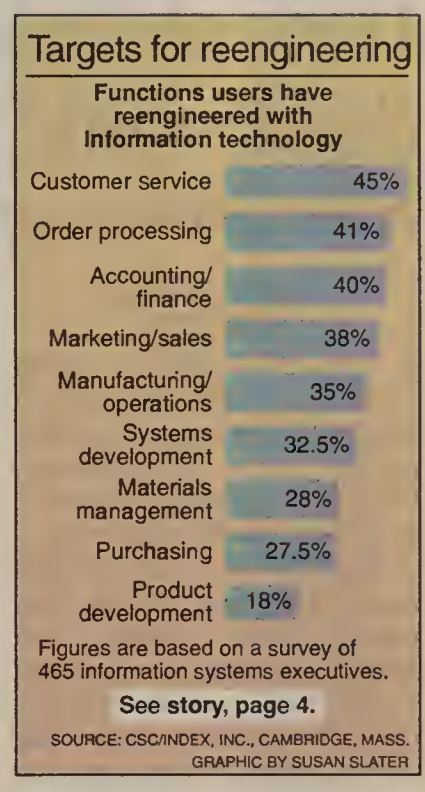
At Esther Dyson's 1992 PC Forum here, Microsoft Chairman and Chief Executive Officer William Gates introduced the Windows Open Services Architecture (WOSA), which incorporates key network concepts the company has discussed during the last six months.

The architecture will enable Windows application developers to take advantage of a variety of network services and other facilities, such as database access and messaging tools, by writing to a standard set of WOSA application program interfaces (see graphic, this page).

The products that actually provide those services will communicate with Windows through a back-end programming interface called the Service Provider Interface (SPI).

WOSA is designed to let Windows users mix and match underlying network services as easily

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NETLINE

UDS MOTOROLA PREPS new software, modem that transforms remote PCs into NetWare LAN nodes. Page 2.

LOTUS DETAILS PLANS to bolster Notes' work flow features with Action Technologies' automation software. Page 2.

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ISOCOR CRACKS E-MAIL market with products supporting 1988 version of X.400 standard. Page 4.

FCC UNDER PRESSURE to establish net reliability, quality standards after latest outage. Page 4.

DESIGN CHANGES BRING greater attention on technologies shaping user nets, make it easy to find info. Page 30.

FEATURE

Crossing the enterprise with LAN E-mail messages

By Daniel Blum
Special to Network World

Once a tool for departmental message exchange, local-area network E-mail systems are taking on a new role within many companies. Users today are realizing the potential for LAN E-mail to redefine the way information flows within an enterprise and out to other companies.



LAN electronic mail is evolving rapidly from a text exchange utility to a store-and-forward infrastructure that can bolster users' efforts to automate office tasks. Instead of swapping simple messages, today's LAN E-mail users are exchanging information packages containing files that can be edited, facsimiles and even images.

In addition, software developers that are armed with a handful of de facto standard messaging application

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Firm unveils alternative to IBM NPSI

By Paul Desmond
Senior Editor

IRVINE, Calif. — Sync Research, Inc. last week announced enhancements to its SDLC-to-token-ring converter that position the device as an alternative to IBM's front-end processor-based X.25 and frame relay offerings.

Sync Research's SNA Network Access Controller (SNAC)/Token Ring Concentrator (TRC) converts IBM's Synchronous Data Link Control protocol to Logical Link Control, the data link protocol used on token-ring local-area networks. That allows

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UDS modem transforms remote PCs into LAN nodes

LanFast supports NetWare protocols and gives remote users full access to all LAN resources.

By Paul Desmond
Senior Editor

HUNTSVILLE, Ala. — UDS Motorola this week will announce a new modem and software that lets remote computers act as fully functioning nodes on a Novell, Inc. NetWare LAN.

UDS' new LanFast net modem includes an adapter board for direct attachment to an Ethernet local-area network and software that supports NetWare protocols. By using complementary LanFast software on a personal computer or laptop, a remote user can dial in to LanFast and obtain access to any LAN resource.

Direct LAN attachment separates LanFast from products such as Microcom, Inc.'s Carbon Copy or Symantec Corp./Peter Norton Group's Norton pcAnywhere, which require a dedicated PC, according to Bill Schlosser, director of business development for UDS, based here. "Most companies don't have spare PCs sitting around," he said. "It's an expensive way of doing it."

LanFast, which costs $1,995, is compatible with the V.32bis and V.42bis standards and operates at up to 14.4K bit/sec. It has an RS-232 port that can provide a

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Lotus airs plan to upgrade Notes' work flow features

To enter partnership with Action Technologies.

By Barton Crockett
Senior Editor

CAMBRIDGE, Mass. — Lotus Development Corp. last week announced an agreement to incorporate Action Technologies, Inc.'s work flow automation software into its Notes groupware.

Chuck Olson, a Notes product manager at Lotus, said his company hopes to use software from Action Technologies to provide work flow automation capabilities in Notes within a year. The software would, for example, enable Notes to deliver electronic documents to end users at preset times or after predefined events.

Lotus also hopes to provide a feature that will let Notes users monitor the flow of documents across a network.

Incorporating Action Technologies' software into Notes could make a strong platform for work flow applications, which automate the movement of purchase orders, contract bids and other documents across an enterprise. Work flow applications are expected to soar in popularity as users streamline business processes.

"Office automation in the 1990s will have strong work flow

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Inverse multiplexer maker ready to add BRI support

By Bob Brown
Senior Editor

PORTSMOUTH, R.I. — Today, Promptus Communications, Inc. plans to announce support for ISDN BRI services on its Open Access to Switched Integrated Services (OASIS) line of inverse multiplexers.

Promptus said it has implemented Basic Rate Interface support on its OASIS line so users can run videoconferencing and other bandwidth-on-demand applications over BRI lines to local exchange carriers' central offices, where they access other switched services.

Where available, BRI is a cost-efficient access method, though it is not designed to pass data between switches in a local carrier's network.

Promptus will support BRI on both its OASIS 200 Switched Bandwidth Controller, which is its low-end inverse mux for small and remote offices, and its OASIS 1000 Bandwidth Manager, a high-end modular model.

The company will roll out a new version of its OASIS 200 — the OASIS 200B — that will be designed specifically to support BRI, said Jim Dolce, vice-presi-

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Briefs

FCC OKs first AT&T contract deals. The Federal Communications Commission last week gave AT&T the green light to begin selling the two new contract deals it filed last month ("AT&T breaks new ground with contract service deals," *NW,* Feb. 17). The approval means AT&T has cleared the first hurdle in its battle to sell telecommunications services at a discount under contracts instead of published tariffs, although the legality of the contracts may still be challenged at a later date.

The first contract deal gives customers four T-3 lines of no more than 140 miles and associated access charges for $660,000 per year, a discount of about 40% off current tariffed rates. Customers must order before May 31 and have the service installed by June 30. The other deal gives resellers discounted Megacom service if they commit to spend between $25,000 and $120,000 per month.

DEC to resell VINES. Digital Equipment Corp. this week is expected to round out its personal computer-based local-area network offerings with an agreement to resell Banyan Systems, Inc.'s VINES network operating system, according to sources close to the company. With commitments already to sell Novell, Inc.'s NetWare and Microsoft Corp.'s LAN Manager, DEC now will offer customers the option of using any of the leading LAN vendors' software.

Novell goes against the tide. Continuing to defy the recession, Novell, Inc. last week reported revenue of $205 million for its first fiscal quarter ended Feb. 1, up 52% from revenue of $134.6 million for the same three-month period in fiscal 1991. Earnings rose 71% to $52.2 million from $30.4 million in the first quarter of 1991. NetWare 3.11 software sales accounted for about 50% of the company's total revenues for the quarter and grew by more than 80% compared to the first quarter in 1991.

Security goes global. An ad hoc group of U.S. computer and network security professionals next week is expected to recommend the formation of an international computer security foundation that would establish standards and specifications for building security products, among other things. The group formed last summer to provide an industry response to six recommendations laid out in a National Research Council report called "Computers at Risk."

The group is composed of representatives from the Information Technology Association of America (formerly Adapso), the Computer and Business Equipment Manufacturers Association and the International Systems Security Association, a group of security professionals at user firms.

IBM eyes new university net technology. Distributed Information Coherency Assurance Corp. (DICA), a new company formed to bring to market products incorporating new network technology developed at Carnegie-Mellon University, plans to formally announce its debut in coming weeks. DICA will sell software developed at Carnegie-Mellon that lets networked Unix workstations perform distributed data processing and monitor one another to quickly diagnose faults.

IBM is negotiating a license to use the technology, said Kevin Ritschel, director of marketing at TechSource Development Corp., a technology development firm in Houston that is working with the university to commercialize the software and attract investors to DICA.

CONTACTS

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Borland plans software to link users in work groups

Existing technology used to promote data sharing.

By Timothy O'Brien
West Coast Bureau Chief

TUCSON, Ariz. — Borland International, Inc. last week outlined plans to provide client-based software that would interface with desktop applications and provide users with the capability to share information in a work group.

At Esther Dyson's PC Forum Conference here showcasing new technologies, Borland said it would use components its Interbase relational database server technology to create the Object Exchange. The software would allow users to transparently send or receive data from within an application using a variety of technologies, including local-area networks, electronic mail, telecommunications services, facsimile and pagers.

Borland claims its intent with the Object Exchange is not to provide a server-based groupware application, such as Lotus Development Corp.'s Notes, which has its own operating environment, but to provide the capability for users to work together using the applications and communications resources already in place.

"Our Interbase database technology fits in with what we are doing for work group collaboration," said Richard Schwartz, senior vice-president and chief technology officer at Borland.

The Object Exchange is an extension of Borland's Object Component Architecture, which is an open architecture based on Interbase that Borland is using to build its work group products.

The firm said its client-based approach would allow users to share both data and discussions, a term that refers to the more unstructured or interactive type of information sharing that is the basis for some leading groupware applications, such as Notes.

Although Borland is not discussing specific product plans or details on how this strategy will be implemented, company officials said work on the product is already in progress.

The company's plans call for the Object Exchange to support more than just Borland applications. It is expected to operate as a separate program and provide access to various communications resources from other applications.

"Object Exchange is being designed to manage all the available communication options from the desktop and coordinate the sending and receiving of information," said Ken Einstein, Borland's director of application strategy.

For example, if a user working in a spreadsheet needs to update certain executives and managers in remote offices with new financial projections, the software would know the best method for communicating with those employees when the user requests that the Object Exchange send information to those individuals. It would then send the data via a LAN, fax or another appropriate method.

Borland said its new work group connectivity thrust is aimed at addressing some of the shortcomings in current work group computing products, such as the need to leave an application in order to correspond with another user. In addition, many of these tools must be implemented throughout an enterprise before the benefits of sharing the information can be realized.

Borland's approach calls for the company to leverage Interbase to provide several levels of interaction at the desktop — including user-to-user, user-to-application and application-to-application — without human intervention.

This is possible because Interbase's technology provides advanced features for peer-to-peer communications. "Interbase is advanced database technology that provides some strong hooks for distributed processing that Borland could leverage in a work group environment," said Peter Kastner, vice-president of Aberdeen Group, Inc., a research and consulting firm in Boston.



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Firms reengineer processes via information technology

Most, but not all, redesign efforts pay dividends.

By Wayne Eckerson
Senior Editor

CAMBRIDGE, Mass. — A survey released last week of network and information systems (IS) executives shows that a majority of large companies are using information technology to reengineer business processes but are not always meeting with success.

The survey, which polled 465 executives in North America, indicates the business areas companies are redesigning with the help of information technology, as well as the obstacles to reengineering efforts and anticipated outcomes.

CSC/Index, Inc., the information technology consulting company here that conducted the survey, defines business reengineering as the use of information technology to achieve a radical redesign of business processes and organizational structures for competitive gain.

More than 60% of the respondents said they are reengineering business processes.

Almost half of the companies (45%) surveyed are undertaking reengineering projects to increase the speed of business processes. Other top goals for reengineering are to reduce costs (21%), improve service (16%), increase quality (10%) and increase revenue (10%).

Most companies target more than one business function to redesign. But the areas companies are most likely to redesign are ones that involve the greatest contact with customers. About 45% of the firms that are reengineering business processes are focusing on customer service, and 41% are focusing on order processing (see graphic, page 1).

Other functional areas that businesses are redeveloping are:

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AT&T digs in on Tariff 12 revision issue with FCC

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — AT&T last week continued pressing its claim that unless the FCC relents and allows major changes to one of AT&T's Tariff 12 deals, the carrier could suffer serious financial harm.

In August, the Federal Communications Commission issued an order freezing modifications to existing Tariff 12 deals and, since then, has barred any major changes. AT&T has twice attempted to change or eliminate Tariff 12's Option 58, saying that if it cannot modify the deal, customers could abandon it before the carrier makes a profit.

AT&T's efforts to change or dump Option 58 have sparked a battle with resellers, which claim that the carrier is trying to keep them from reselling the service. Option 58 is favored by resellers because of its service mix and favorable terms and rates.

In a filing earlier this month, AT&T asked the FCC to reconsider its decision in December that prevents the carrier from adding a $1.1 million installation charge for new Option 58 customers. The FCC rejected that request.

AT&T says it must add the charge since the FCC in August instituted a new rule — dubbed "fresh look" — that allows Tariff 12 customers to terminate their deals without penalty in March 1993, when 800 number portability is scheduled to occur.

Option 58 is structured so the carrier loses money in the first year of the contract and makes its profit in the second and third years. AT&T argued that a customer could sign up for Option 58 now and dump the deal in March 1993 before it can turn a profit.

According to filings, the carrier expected to lose between $70,000 and $110,000 per customer in the first year of Option 58, depending on the customer's amount of requested service. In the second and third years of the deal, AT&T expected to make a profit of between $260,000 and $330,000 per user, also depending on the service level.

Some customers have privately expressed concerns about AT&T's commitment to Tariff 12 users since it is trying to discontinue one of the deals, calling into question whether AT&T is complying with the FCC's general rules as well as specific Tariff 12 rules, which both require the car-

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Start-up intros X.400 mail, EDI and security products

By Bob Brown
Senior Editor

LOS ANGELES — As expected, start-up ISOCOR last week announced a bevy of new electronic messaging products, including some of the first end-user application software on the market to support the 1988 version of X.400.

International Standards Open Communications Resources (ISOCOR), which was established last year by Retix founder Andy De Mari, will demonstrate its software for the first time at the Hannover Fair CeBIT in Germany later this month ("Start-up to introduce OSI product suite at CeBIT fair," *NW*, Feb. 17). Products will start rolling out about midyear.

ISOCOR announced a messaging system based on the 1988 X.400 specification that runs on IBM's RS/6000 workstation; electronic data interchange software adhering to the 1984 and 1988 versions of X.400; and security software. The products are designed to work together, but some of them can be used independently.

"We are bringing applications like EDI together with the most advanced X.400 transport system," De Mari said. "So we've got the application and communications worlds converging on OSI-based systems."

The X.400 messaging system, ISOPLEX 800, includes server software that runs on IBM's RS/6000 servers and accompanying software for clients. ISOPLEX 800 software running on a single, top-of-the-line RS/6000 could handle at least 500 users, De Mari said.

Although the software has been designed for use on the RS/6000, he said ISOCOR will port its software to other Reduced Instruction Set Computer (RISC)-based and IBM Personal Computer-compatible platforms down the road.

ISOPLEX, residing on a server, works in conjunction with complementary ISOMAIL 800 agent software running on Unix-, Microsoft Corp. Windows- or DOS-based PCs. The software enables users to compose, send and receive electronic mail messages

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UB shrinks Enterprise Hub, offers up 10Base-T module

By Maureen Molloy
Staff Writer

SANTA CLARA, Calif. — Ungermann-Bass, Inc. last week unveiled a smaller version of its Access/One Enterprise Hub as well as a new 10Base-T Ethernet module that can be expanded to support added functions on its hubs as needed.

The new Access/One 2-Slot hub offers the same capabilities as the company's five- and 11-slot intelligent switching hubs but is designed for smaller departmental and remote offices.

"[The hub] allows remote offices to be easily hooked into the enterprise network without investing in a large chassis," said Shirley Hunt, networking industry analyst at Dataquest, Inc., a consultancy in San Jose, Calif. "It provides the benefits of a high-end system without the cost."

The hub incorporates Ungermann-Bass' PlusBUS Reduced Instruction Set Computer (RISC) switching architecture and comes equipped with a 320M bit/sec backplane. It also features hot swapping of local-area net cards.

It supports any combination of two Ethernet, token-ring, Fiber Distributed Data Interface or Apple Computer, Inc. LocalTalk LAN cards. The chassis can also house an optional half-card Ungermann-Bass Supervisor Module for network management or a smaller Network Connection card in the back of the enclosure, thereby leaving the two slots available for standard LAN cards.

An optional Media Extension Adapter can plug into the back of the chassis to support as many as 24 direct RJ-45 connections, eliminating the need for wiring closet punch-down blocks. In addition, one of the LAN cards can

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Pressure on FCC to set net standards

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — The FCC was dealt an embarrassing blow last week when it was disclosed at the first public meeting of the agency's Network Reliability Council (NRC) that US West, Inc. suffered a three-day outage in the state of Washington last month that was never reported to the agency.

Officials from the Federal Communications Commission have assured users, industry executives and lawmakers that the agency is on top of network reliability issues and is taking an active role in preventing outages. Last month, the FCC ordered carriers to report all outages affecting more than 50,000 customers for 90 minutes.

But the outage in Bellevue, Wash., may put more pressure on FCC Chairman Alfred Sikes to establish network quality standards. At the meeting, Sikes moderated his opposition to such standards, saying he would consider setting industry benchmarks for carriers to meet.

The Bellevue outage lasted from Feb. 11 to the early hours of Feb. 14 and knocked out all services to 4,100 customers, including city hall and the police department. The outage was caused by the destruction of two fiber-optic cables by a drilling crew. The network problem was not reported to the FCC, according to James Keegan, chief of the agency's domestic facilities division.

News of the outage was also not reported to the NRC but came to light only after a passing comment by Craig McCaw, president of McCaw Cellular Communications, Inc., which has operations in Bellevue.

One of the major topics discussed at the NRC meeting was whether the 50,000 customer cutoff for reporting outages is sufficient to protect users. Some user groups have complained that the FCC's rules will only catch the most catastrophic outages.

Members of the NRC include representatives of the Big Three long-distance carriers, the seven regional Bell holding companies and user groups.

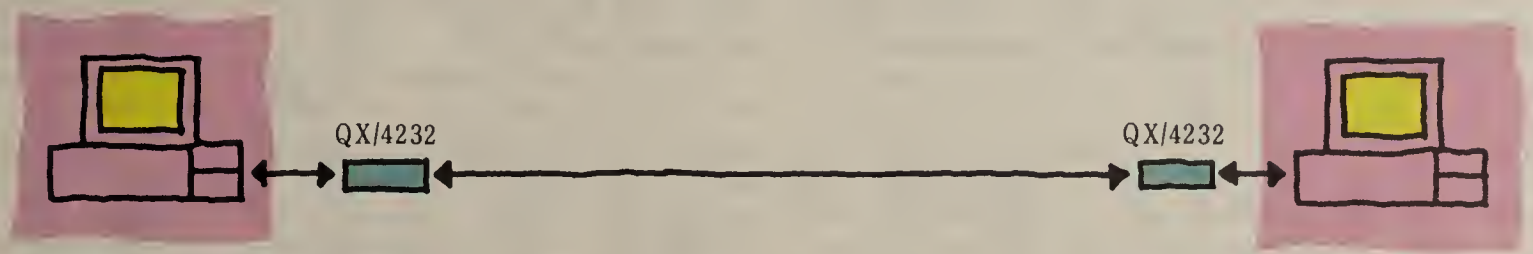
"There's no question that we have some reliability problems in the network today, [and] we're going to have some more problems [in the future]," said Paul Henson, chairman of the NRC and former head of United Telecommunications, Inc. "We've depended on competition to set standards and goals, and that's not enough."

The group agreed to form working committees to explore major causes of outages, such as signaling, software and power problems.

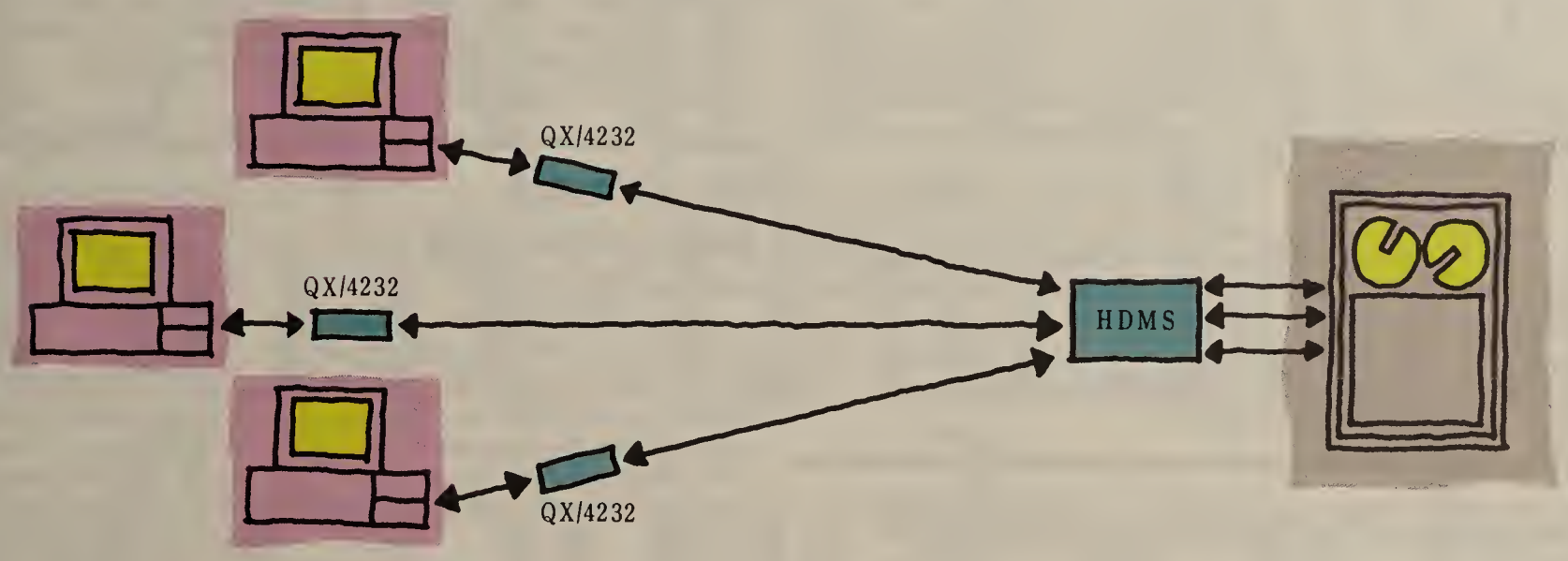
The NRC is expected to report on the issue of thresholds for reporting outages during the next

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Net services strategy debuts for Windows

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as they can swap applications, according to Microsoft (see "Windows to be universal net interface?" *NW,* Nov. 18, 1991). For example, a Windows application could transparently access data in a diverse array of databases or access the services of different network operating systems through WOSA facilities.

The ideas embodied in WOSA have been fermenting at Microsoft for some time. While few of the network capabilities WOSA promises are available, the network architecture was designed to reassure users that Microsoft is not deaf to their demands for more and better network connections, said Nancy McSharry, PC program manager for International Data Corp. in Mountain View, Calif.

"I don't think they're doing anything new," McSharry said. "They're just trying to restructure what they've already announced so that it's neater."

For example, Microsoft last year announced Open Database Connectivity (ODBC), a Windows service and API for connecting PCs with a wide range of database servers. ODBC's API will be absorbed into the WOSA APIs and the services will be implemented as a module under WOSA's SPI.

Likewise, Microsoft's Messaging API (MAPI), a standard API for mail products also announced last year, will be lumped under WOSA's APIs, while Microsoft Mail could become one of the service modules accessed through MAPI, said Mike Fritz, product manager at Microsoft.

The company will continue to add APIs and associated services to the architecture, including directory services, software version control, and file and print services.

WOSA also represents an interim step to the next generation of Windows, which Gates referred to by its code name, Windows Cairo. The architecture offers programmers today a taste of the modularity and universality they can expect in two to three years from Windows Cairo's object-oriented environment, said Collins Hemingway, senior public relations manager at Microsoft.

So where does the much-vaunted Windows NT fit in?

"NT just has more horsepower," said Hemingway. "NT is our OS/2, if you will. In a sense, it's all the high-end things we promised in OS/2 but haven't delivered." Some of those capabilities include support for multiple processors, server functions and 32-bit operations.

Although NT is often juxtaposed against the futuristic operating system expected from Taligent, Inc., IBM and Apple Computer, Inc.'s joint venture, Windows Cairo is a more appropriate equal, according to Hemingway.

For now, Microsoft is scheduled to announce and ship Windows 3.1 in April, said Hemingway. The new version promises to have improved network and object-oriented features. For example, Windows users will be able to attach to network file servers by clicking an icon and typing in a password.

Internet community embraces SNA

continued from page 1

achieved by merging SNA and LAN traffic onto a single path."

The Travelers Corp. in Hartford, Conn., for example, is aiming to fold its SNA and bridged IBM Token-Ring Network traffic into a nationwide LAN internetwork, according to Steve Simon, engineering project manager for the company. The Travelers is on the brink of choosing a router vendor, and the ability to support SNA will be a key consideration.

Other users, however, are not acting as quickly. John McQuillan, president of McQuillan Consulting in Cambridge, Mass., said many of his clients are reluctant to convert their SNA network to a LAN-based net because of the perceived unreliability and haphazardness of LAN environments.

"While putting SNA onto a router backbone is great in theory, in practice, it raises many performance issues for users," said McQuillan said. "Users want a solution that's as reliable — if not more reliable — than their current SNA solution."

Users are also looking for a good migration path to internets, especially for traditional Synchronous Data Link Control traffic. John Rohal, managing director of Alex. Brown & Sons, Inc., a Baltimore consultancy, said many IBM users will demand transparency and minimum complexity as they make the transition from hierarchical SNA nets.

With few variations, the leading router vendors are converging on similar SNA strategies.

Cisco Systems, Inc. recently announced the third part of a five-phase strategy to enhance support for SNA traffic. Phases 1 and 2, completed last year, involved upgrading Cisco's routers to support encapsulation of both token-ring based SNA data and SDLC data in Transmission Control Protocol/Internet Protocol packets.

The major additions in Phase 3 include a feature that enables its routers to terminate 802.2 Logical Link Control 2 (LLC2) timers and acknowledge packet receipt for the remote devices. This obviates the need for acknowledgment data to be sent over wide-area links and keeps SNA sessions alive if a failure forces use of an alternate network path.

(continued on page 51)

UB shrinks Enterprise Hub

continued from page 4

be swapped for an Ethernet or token-ring bridge module. The LAN cards support fiber-optic and coaxial cable. Ethernet, token ring and LocalTalk are supported over shielded or unshielded twisted-pair wiring.

Available now, the Access/One 2-Slot enclosure costs $995, not including the LAN cards.

Ungermann-Bass also announced a 10Base-T module that fits into its intelligent hubs. Users can purchase optional daughterboards for the module that support capabilities such as network management and security. The base version of the module, the ASM320T Tier 1 10Base-T Ethernet Concentrator, is a 12-port 10Base-T card that can be managed via the Simple Network Management Protocol.

A daughterboard can be added to provide expanded port-level performance, as well as fault and configuration management. The RISC-based AMO320T/2 Tier 2 Daughter Card comes equipped with a built-in Flash E-PROM .

The ASM320T module is priced at $1,450, and the AMO320T/2 daughterboard costs $995. Both are available now.

Inverse multiplexer maker to add BRI

continued from page 2

dent of engineering at Promptus. The product will support four BRI lines, or eight 64K bit/sec B channels, for a total dial-up capacity of 512K bit/sec, he said.

For the OASIS 1000, Promptus will make available BRI plug-in modules, each of which will support four BRI lines or eight 64K bit/sec B channels, Dolce said.

Previously, Promptus offered only T-1 and Integrated Services Digital Network Primary Rate Interface (PRI) access from its inverse multiplexers to local and long-haul carrier switched services. That support was adequate for accessing switched services from long-haul carriers but not for switched services from the local exchange carriers.

Slow on PRI

While most of the local exchange carriers have been deploying BRI lines in their territories, they have been slow to roll out PRI.

The OASIS 1000 is a 15-port chassis-based system that can support any blend of access and data port modules, allowing users to customize the system for their needs.

Pricing for the BRI products will be announced soon, Dolce said. Promptus will begin shipping its BRI products within 90 days.

Impact abroad

While the BRI additions will make accessing local exchange carriers' switched services more efficient, BRI support may be even more significant for users with sites overseas, according to Dolce. BRI lines are priced lower in other parts of the world, such as Europe, whereas PRI is prohibitively expensive. Users that need to conduct videoconferences with remote sites overseas would be typical users of the OASIS products with BRI support, he said.

Promptus' rollout of its BRI products will include versions for Canada, France, Germany, the U.K. and the U.S. The company has received approval to sell the product in Japan and plans to roll it out in Belgium, Denmark, Italy and Sweden in the future.

Analysts said support for ISDN BRI has limited importance in the U.S. but is critical overseas, where ISDN has been deployed more widely.

"Inverse muxes have got to support BRI to be successful overseas because [BRI] is one of the top means of accessing a carrier's net," said Daniel Briere, president of TeleChoice, Inc., a Montclair, N.J., consultancy. "Boxes with BRI support will probably be used heavily in countries like France, Germany and the U.K., where ISDN is [widely] deployed."

Other players in the inverse multiplexer market, such as Ascend Communications, Inc. and Teleos Communications, Inc., support BRI on their products as well.

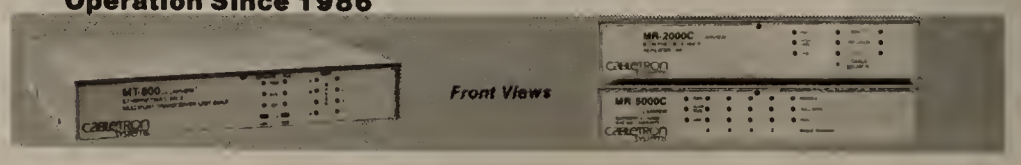
Senior Editor Bob Wallace contributed to this article.

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Worth Noting

Three classes of end users are defined in IBM's Systems Network Architecture: I/O devices, terminal operators and application programs, according to Anura Guruge, lead consultant at BBN Communications Corp. in Cambridge, Mass. "The only class of end user that IBM is now serious about is application programs," he said.

Data Packets

Dowty Communications, Inc., of Annapolis Junction, Md., last week said it will offer inverse multiplexing capabilities in its line of T-1 muxes in the second quarter of this year.

Inverse multiplexing will provide users with cost-effective bandwidth on demand for high-speed applications such as image transmission, mainframe file transfers, LAN-to-LAN connectivity and video conferencing.

When integrated with Dowty's DCP9506 access mux, inverse multiplexing allows other applications, such as voice and dedicated data services, to share the same T-1 access circuit.

The inverse multiplexing module will be designed for Dowty by **Axxess Communications, Inc.** of Marlton, N.J. The module is expected to include RS-449 and V.35 interfaces, and will use multiple switched 56K bit/sec connections.

Pricing for the product will be announced upon its release.

IBM unveils CICS package for AS/400 minicomputers

Also unveils directory features for OfficeVision/400.

By Jim Duffy
Senior Editor

ARMONK, N.Y. — IBM recently brought out software that enables its Application System/400 minicomputer to run transaction processing applications and moved to ease administration of the systems in an office environment.

CICS/400 allows users to develop CICS applications on the AS/400 or port existing CICS applications from IBM mainframes.

CICS/400 allows AS/400 users in remote sites to access data and initiate transactions on IBM mainframes or other AS/400s. Through LU 6.2, IBM's protocol for application-to-application communications, CICS/400 users can establish sessions with other CICS systems to share data and resources.

The product also includes an application program interface that enables programmers to develop applications that are portable across CICS platforms. "This is a vehicle to distribute CICS applications to the AS/400 to take advantage of AS/400 economics," said Terry Baehr, director of Application Business Systems marketing, IBM U.S. Marketing & Services. "It's another expansion for the customer who wants to decentralize or departmentalize" transaction processing.

CICS/400 is priced from $1,750 to $59,850 and will be available this month.

IBM also brought out a directory management feature for OfficeVision/400 networks. OfficeVision is IBM's Systems Application Architecture-based office automation software.

The directory management feature of OfficeVision/400 Version 2 Release 2 automatically

(continued on page 12)

DEC adds to Polycenter service line

By Jim Duffy
Senior Editor

MAYNARD, Mass. — Digital Equipment Corp. recently announced three services designed to help users improve systems management and data center operations, and unveiled software that aids in correcting VMS system utilization problems.

The services are Information Systems Operation Review (ISOR), Lights Out Computing Design and Information Systems Organization Design. All three are components of DEC's Polycenter suite of systems management products and services.

ISOR provides users with a comprehensive assessment of systems and resource management from both a management and technical perspective. It is intended to provide a road map of actions to be taken to increase the efficiency of a customer's computer operations.

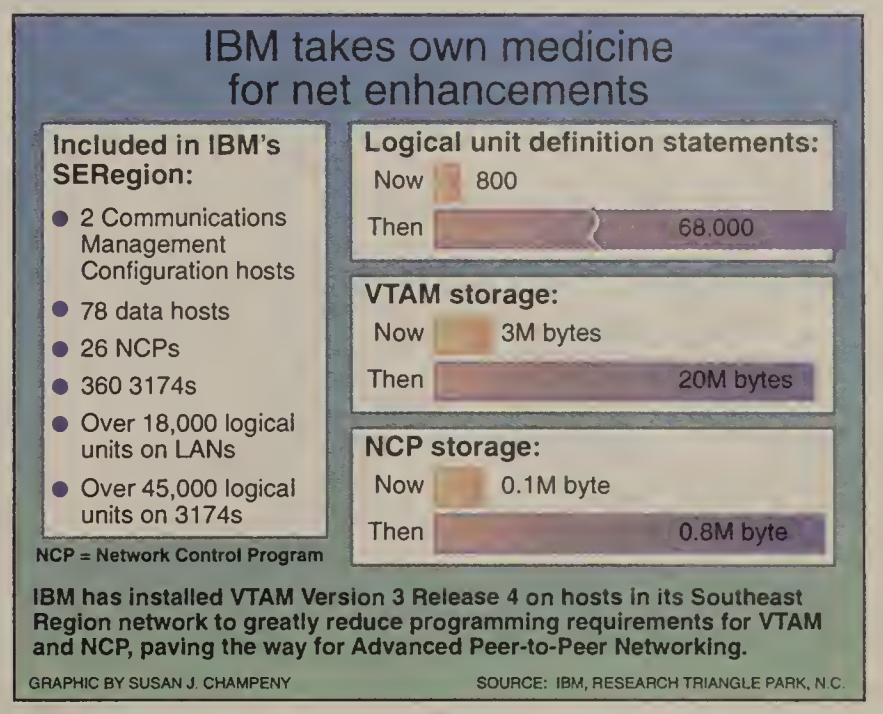
Under the Lights Out Computing Design service, DEC consultants help users develop a plan for operating data centers with a minimum of personnel. The service is also intended to reduce the need for staff to maintain the data center after business hours.

Information Systems Organization Design assists customers in redesigning their IS organizations and processes. DEC consultants help users define a business purpose for their IS operations and then institute an organizational structure and procedures for operating and maintaining IS more efficiently.

ISOR starts at $50,000 and is available now. Lights Out Computing Design and Information Systems Organization are available now in Europe and will be available in the U.S. in May. Pricing in Europe is customized based on the scope of the project. Customized pricing for the U.S. has not yet been established.

The company's new DEC Availability Manager for Distributed Systems (DECamds) is software that monitors and diagnoses VMS system resource utilization problems. It enables users to monitor multiple systems on an Ethernet local-area network, presenting utilization information in color-coded bar graphs in a DECwindows display.

(continued on page 12)



IBM sees new VTAM as its APPN future

Latest version simplifies net configuration tasks, will use APPN-like features to boost productivity.

By Paul Desmond
Senior Editor

RESEARCH TRIANGLE PARK, N.C. — IBM is practicing what it preaches on its internal network by taking advantage of the latest VTAM release to reduce configuration chores in its Southeast Region network and pave the way for Advanced Peer-to-Peer Networking (APPN).

Installation of VTAM Version 3 Release 4 has helped IBM drastically reduce the number of configuration parameters that must be manually entered for its mainframes, thereby increasing staff productivity and simplifying network moves and changes.

The enhancements are also a first step toward supporting APPN on the mainframes, a development that will further reduce the manual net definitions required and provide enhancements that increase overall network availability.

IBM uses a Communications Management Configuration (CMC) in its Southeast Region network, which consists of nine campuses and serves the Southeast quadrant of the country, said Mark Pozefsky, program manager of VTAM strategy design and performance for IBM.

Under CMC, one or two mainframes handle session establishment and net management for all networked devices. Other mainframes in the network, dubbed data hosts, only run applications.

IBM has two CMC hosts for its Southeast Region net plus 78 data hosts. Twenty-six front-end processors running IBM's Network Control Program (NCP) support more than 60,000 logical units in the network (see graphic, this page).

To support all those logical units required 68,000 definition statements in VTAM. Each definition statement includes various parameters used when establishing a session with the device, such as its screen and message size as well as class of service.

Some types of devices, such as intelligent personal computers, can have as many as five simultaneous sessions and, therefore, need five definition statements. Many users also predefine logical units for every jack in a building, whether or not it is being used, Pozefsky said. "Most users prepare for the worst," he said.

VTAM Version 3 Release 4 supports dynamic definition of logical units for PU Type 2 devices, obviating the need to define each logical unit in advance. Instead, users define only the most common logical unit configurations, or models, which are copied as needed.

For its Southeast Region, IBM specified 800 such models, a dramatic drop from the 68,000 definitions it previously needed. When a terminal powers on, mainframe-based code deter-

(continued on page 12)



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IBM sees new VTAM as its APPN future

continued from page 9

mines which type of device it is, chooses the appropriate model and then dynamically defines the logical unit to VTAM.

"We're providing a very late binding or definition of the devices in the network," Pozefsky said. "So you only have to define the nodes you're really using, as opposed to those you hypothetically might want to use."

The reduction in definition statements also means a reduction in VTAM and NCP storage requirements. But the enhancements in VTAM Version 3 Release 4 are a mere precursor of those to come when IBM rolls out APPN support in VTAM and NCP, according to Pozefsky.

With APPN support, VTAM will be able to dynamically define intelligent devices — such as PCs and cluster controllers — without the use of mainframe-based code or models. It also increases routing options. Today, a 3174 must be one hop away from an NCP. "We're going to add a function [to VTAM] soon that allows you to have a generalized APPN network between an NCP and the dumb [terminal]," he said.

That would give users more cost-effective options for connecting dumb devices to front-end processors, rather than using a serial line for each controller. Those options could include attaching multiple cluster controllers to a series of interconnected local-area nets, for example.

Another enhancement that APPN will bring IBM is the ability to configure its nearly 80 data hosts as APPN end nodes. That will eliminate the need to define data paths to each host, Pozefsky said.

"The number of those path definitions is [roughly] the number of nodes squared because you have to set up different paths between every pair of nodes," he explained.

IBM estimates that APPN support on its hosts will drop path definition requirements from the current 207,000 to 23,000, he said.

The biggest benefit gained by avoiding data path definitions is increased availability of hosts. "By making the data host an end node, you're not requiring it to come down if something in the network changes. That type of availability will have significant payback to the enterprise as a whole," he said.

APPN will also reduce the data flows required between a CMC host and a data host at the beginning of a session. "On average, we go from 10 flows down to two flows," Pozefsky said. "When you are recovering from downtime or [during Initial Program Load], you'll see significant improvement in start-up time because we're doing fewer things."

IBM unveils CICS package for AS/400

continued from page 9

replicates across the net the identification and address of new or relocated users. All references, such as calendars, documents, folders, administration and distribution lists, are also automatically updated.

The directory management feature includes an option that allows an administrator to automatically enroll a user for OfficeVision/400 services if that user is not listed in the system directory. The latest release is priced from $1,650 to $56,510. It will be available in December.

IBM also unveiled Workstation Remote Initial Program Load (IPL)/400, software that enables remote, diskless workstations on a Token-Ring LAN to download data and applications that are stored on an AS/400 server. The software also allows those workstation to store the data and applications back on the AS/400 after use.

Workstation Remote IPL/400 will be available in September. It is priced from $425 to $5,105.

DEC adds to Polycenter line

continued from page 9

DECamds comprises two programs: DECamds Console and RMdriver. DECamds Console runs on a VAXstation 3100 and directs RMdriver to collect system-level data. It can sort problems, such as over-utilization of the CPU, memory and I/O, by severity so managers can take immediate action on the most serious problems.

DECamds can also instruct RMdriver to automatically take corrective action or aid a systems manager in intervening to apply fixes to remote systems over the LAN.

RMdriver runs on VAX systems on the LAN. It can be programmed to allow only system monitoring, or monitoring and problem correction.

DECamds Console is priced at $23,600. RMdriver is priced from $225 to $9,420. Both product are schedule to be available in December.



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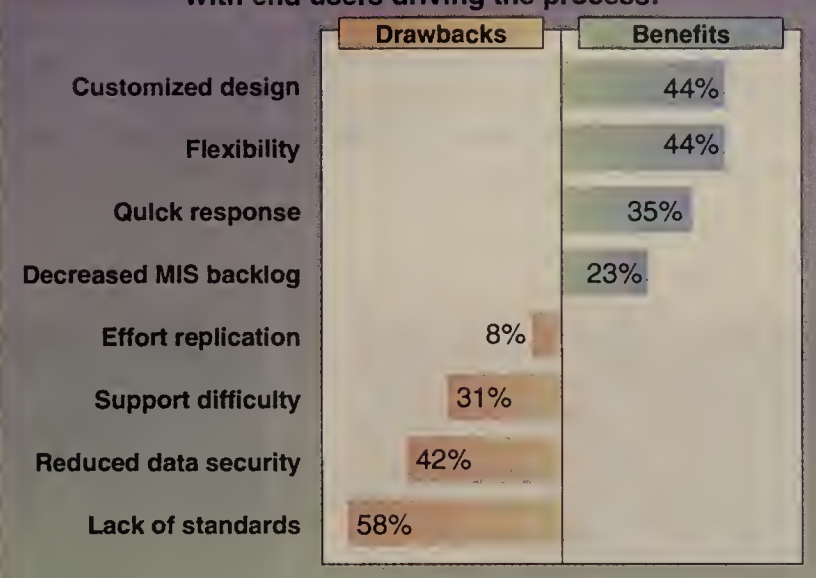
Worth Noting

"While acceptance of the client/server architecture has taken longer than predicted, it is still valid. There is no doubt that the pieces are starting to come together."

John McCarthy
Director of computing strategy research
Forrester Research, Inc.
Cambridge, Mass.

LAN application development issues

With end users driving the process:



According to figures compiled from 52 MIS managers at large corporations, 62% of companies' end users are developing their own LAN applications. That number is expected to increase significantly during the next 5 years.

GRAPHIC BY TERRI MITCHELL SOURCE: FORRESTER RESEARCH, INC., CAMBRIDGE, MASS.

Calif. agency works net magic with LAN

Merced County speeds welfare claims processing by moving from host to LAN-based expert system.

By Caryn Gillooly
Senior Editor

MERCED, Calif. — Merced County officials have just thrown the switch on a new welfare assistance network that will not only save upward of $1.5 million the first year, but will likely serve as a model for welfare systems nationwide.

The Merced Automated Global Information Control (MAGIC) network is anchored by an expert system-based client/server application that lets workers process welfare claims in a fraction of the time previously required.

With the majority of claims processing now done at workstations on a local-area network rather than on a mainframe or by hand, the county was able to cut the time it takes for applicants to receive their first welfare check from more than three weeks to as soon as one day.

By distributing applications processing from a host down to workstations, the agency has been able to cut mainframe processing costs by 70%.

"The critical issue here is to provide a unit of service," said Rita Kidd, MAGIC project director for Merced County's Human Services Agency. "If a client is in a crisis situation and we tell them it will be three weeks before we can see them and another three weeks before they see their first check, the [applicant] may sink further into that crisis."

With the MAGIC network, an eligible applicant can, in some cases, receive a check within as soon as 24 hours after applying for welfare assistance. "Now we can catch them before they have a crisis," she said.

The Merced County welfare assistance net spans several locations. In the main office here, the county relies on an Ethernet LAN using the Transmission Control Protocol/Internet Protocol and Hewlett-Packard Co.'s StarLan net operating system software.

(continued on page 15)

Artisoft pits its souped-up LANtastic against NetWare

Vendor courts NetWare 2.2 users with release.

By Caryn Gillooly
Senior Editor

TUCSON, Ariz. — Artisoft, Inc. recently unveiled a significantly enhanced version of its LANtastic network operating system, which it intends to pit against Novell, Inc.'s NetWare 2.2 software.

Artisoft said LANtastic Version 4.1 offers 20% to 30% better performance than earlier versions, providing users with a viable alternative to Intel Corp. 80286-based versions of NetWare.

The software release comes on the heels of industry reports that Novell may curtail NetWare 2.2 upgrades in order to encourage users to migrate to NetWare 3.X versions. Novell recently denied those allegations (see "Novell pledges to stand behind NetWare 2.2," page 14).

Adrian King, vice-president of engineering at Artisoft, based here, said LANtastic is continually being compared to NetWare Lite, "but the more comparable product has always been NetWare 2.2." He added, however, that because LANtastic was not as fast as NetWare 2.2, many users did not consider the two comparable.

"We tried to address the features of [NetWare] 2.2 in this release — one of which was performance — to remove the final barriers to people choosing NetWare 2.2 over LANtastic," King said.

In addition to performance improvements that Artisoft said puts the software on par with NetWare 2.2, LANtastic Version 4.1 also includes better system management to help administrators install larger networks.

Combined, the enhancements give LANtastic the same speed and features as NetWare 2.2 but at a much lower cost, King said. A five-user version of NetWare 2.2 costs about $900, while an entire network version of LANtastic 4.1, for those customers purchasing Artisoft local-area network adapters, costs $99. An adapter-independent version of LANtastic costs $99 per node.

Faster and more manageable

According to King, Artisoft was able to boost performance on LANtastic 4.1 by adding improved resource caching facilities. Resource caching means that users' file access privilege information is kept in the server's random-access memory instead of on the server's hard disk, enabling users to access files more quickly.

LANtastic 4.1 also supports delayed record locking, which lets a server hold on to a user request for a file that is being utilized by another user. Once the file is available, the server auto-

(continued on page 14)

Netnotes

Microsoft Corp. is scheduled to announce today that it has licensed **Maynard Electronics, Inc.**'s data backup services for inclusion in Windows NT, the server version of Windows that is still under development.

In addition, Microsoft has chosen to use Maynard's proprietary backup tape format as Windows' standard tape format.

Incorporating Maynard's backup engine into Windows NT will enable net managers to back up servers and remote workstations by clicking on an icon instead of running a separate backup program.

In addition, Microsoft's decision to use Maynard's logical tape format will allow net managers to use backup equipment from a number of vendors.

Microsoft will make Maynard's tape format the standard for Windows and offer it to vendors that want to provide backup products that work directly with Windows NT.

Most backup vendors offer proprietary tape formats.

The backup features within Windows NT will be similar to those used in Maynard's MaynStream for Windows, a product that is expected to ship in April.

NetFRAME models redefine superserver's performance

By Timothy O'Brien
West Coast Bureau Chief

MILPITAS, Calif. — NetFRAME Systems, Inc. recently added two new models to its line of scalable local-area network superservers that offer greater performance and increased fault tolerance.

NetFRAME officials also revealed plans to introduce by year end products called single-board servers that can be installed inside NetFRAME superservers to support specific applications, such as databases.

Together, the enhancements will enable the company to position its products against host-based systems as combined file/application servers.

First introduced in 1989, NetFRAME's superservers use clusters of processors, which work in concert to support higher levels of I/O activity and fault tolerance than is typically possible through ordinary personal computers acting as network file servers.

Unlike many fault-tolerant host systems that employ proprietary approaches or operating systems, NetFRAME uses widely accepted Small Computer System Interface storage devices and runs standard network operating systems such as Novell, Inc.'s NetWare or Microsoft Corp.'s LAN Manager.

The two new superservers, the NF450FT and NF250FT, are the first NetFRAME systems to use Intel Corp.'s 50-MHz 80486 technology. Until now, NetFRAME's top-of-the-line NF400 used Intel's 25-MHz 80486 processors.

The new NF450FT server can be configured with as many as 10 processors, 256M bytes of error detecting and correcting memory, and 90G bytes of disk storage.

(continued on page 14)

Firm pits LANtastic against NetWare

continued from page 13

matically establishes access to it for the requesting user. Without the feature, the user request would have been denied and the person would have had to keep retrying manually until that particular record was available.

According to King, the company has also optimized LANtastic's Network Basic I/O System protocol code, which will also have a marked impact on net performance.

On the management side, Artisoft has added a command line to its Network Manager program. This lets administrators set up batch files to perform certain tasks, such as network installation for new customers. According to King, this feature is most useful when installing LANtastic 4.1 at larger sites because it prevents the administrator from having to repeatedly enter identical installation information on all network clients.

"We're beginning to see LANtastic in use on larger networks," King said. "Although the average LANtastic LAN has six nodes, we are beginning to see people with over 100 nodes." That was the reason for the management enhancement, he added.

Beta users satisfied

Users at the LANtastic 4.1 beta sites were pleased with the enhancements. "We have 20 users, each opening as many as 50 files at once [on a loan processing program]," said Warren Stone, network manager at Crestview Financial Group, based in Beverly Hills, Calif. "LANtastic 4.1 lets us open up to 5,000 files [simultaneously] without a problem, and we've seen a performance increase of about 30%."

Doug Waterman, senior process control engineer at Thilmany Paper Division, International Paper, based in Kaukauna, Wis., said the new LANtastic version is easy to manage and provides ample room to expand the company's 20-node LAN.

LANtastic 4.1 is available now at $99 per network (as many as 300 nodes) for users that also purchase Artisoft's LAN adapters.

NetFRAME releases LAN superservers

continued from page 13

The smaller NF250FT supports five processors, 128M bytes of memory and 33G bytes of disk storage.

In terms of either Ethernet or token-ring network connections supported, the NF450FT can accommodate as many as eight interfaces, while the NF250FT supports up to three. The firm's new fault-tolerant features include the ability to restart I/O processors while the system is up and running, a higher level of redundancy for disk and LAN I/O operations tailored specifically for support of NetWare, and a new release of its server-activated maintenance system that generates alerts when problems occur.

Previous fault-tolerant server capability options, such as the ability to replace a drive while the system is running, are now standard features.

In the second half of this year, NetFRAME servers will support the Solaris operating system from Sun Microsystems, Inc.'s SunSoft subsidiary and Unix Sys-

Novell pledges to stand behind NetWare 2.2

PROVO, Utah — Novell, Inc. officials recently denied reports that the company plans to curtail enhancements to NetWare 2.2 or completely phase out the Intel Corp. 80286-based version of the network operating system.

"We have never made an official statement to that regard," said Ladd Timpson, product line manager of work group network operating systems at Novell, based here. "We are still supporting and providing fixes to 2.2. And if customers demand an upgrade, it is not out of the realm of possibility that we'll bring out a new version of 2.X."

According to Timpson, NetWare 2.X represents Novell's largest installed base of the operating system. "We believe NetWare 2.X will remain a viable product for some time," he said.

Novell has, however, made it clear that it is focusing it efforts on the pending release of NetWare 3.2, which is expected this fall. Also, the company has raised the price of NetWare 2.2, so the cost difference between it and 3.11 is less than $1,000 — a move intended to sway customers toward the higher end product.

— Caryn Gillooly



"Uh-Oh . . ." *Donna, Accounting*



"Whoa!" *Jan, Production*



"Hey!" *Todd, Shipping*



"What The . . ." *Dan, Drafting*

tem V Release 4 from Univel, the joint venture of Novell and Unix Systems Laboratories, Inc, according to Enzo Torresi, NetFRAME's president and chief executive officer. The firm also discussed plans to offer single-board servers based on 50-MHz 80486 processors. The system servers will be able to support as many as four single-board servers, making it possible to support I/O intensive applications.

With the additional processing power of the single-board servers, NetFRAME will look to compete with companies such as Digital Equipment Corp. by luring software vendors to port applications to the cluster-like NetFRAME platform.

Last week, Oracle Corp. and NetFRAME announced a joint development agreement that calls for Oracle to port its parallel database server software to this new multiprocessor environment. The NetFRAME single-board servers will also support any application that runs as NetWare Loadable Modules under NetWare 386.

The NF450FT, available immediately, costs $69,950, while the NF250FT, scheduled for availability later this month, is priced at $29,950.

Calif. agency works net magic with LAN

continued from page 13

The LAN consists of about 150 Intel Corp. 80386-based HP workstations attached to a Unix-based HP minicomputer. According to Kidd, each individual workstation houses rules-based expert system software from Aion Corp. This software uses and manages the more than than 5,000 state and government rules that control welfare eligibility and has the intelligence to make an eligibility decision by reviewing applicant information.

In addition to acting as a file server on the LAN for the welfare applications, the minicomputer houses an Ingres database application, which acts as a library or index for the list of eligibility rules that the expert system uses, Kidd said.

The minicomputer is connected via a T-1 line to a mainframe in the county's data center three miles away. The mainframe acts as a repository for applicants' files once they have been processed at the local level. It also uses a database management system from Software AG of North America, Inc. to keep track of all the applicant information. The database application is also responsible for downloading and uploading applicant information to and from the minicomputer when workstation users must access that data.

Kidd said the network in the main office also includes about 80 dumb terminals that connect directly to the mainframe, where initial applicant information is recorded. In addition, the MAGIC net ecompasses about 35 other personal computers distributed throughout three remote offices — all connected to the mainframe — providing access to client information.

The process

To apply for assistance, a prospective welfare recipient comes to the main office or one of the branch offices and fills out a one-page form. The form is given to an employee at a dumb terminal, where that information is entered directly into the mainframe.

If that applicant meets general eligibility requirements, the clerk uses a calendaring program to set up an initial meeting with a welfare representative within three days.

The night before the initial meeting, the mainframe database application automatically downloads the necessary applicant files to the HP minicomputer, where the workstation users will be able to access them the next day.

At the meeting, an agency representative at a LAN-attached workstation enters more detailed data, such as the type of assistance that is needed, including food stamps, cash assistance and foster care.

The expert system automatically determines whether the client is eligible for the type of help requested and the amount of payments according to the eligibility rules.

That night, the updated client files are sent back to the mainframe.

Before MAGIC, the client would come in, be given 12- to 14-page forms to fill out and return for a scheduled appointment usually about three weeks later to review the forms with the representative, Kidd explained. Three weeks later, the representative would determine the applicant's eligibility and manually calculate the client's budget.

With the new system, all representatives can handle all types of welfare requests in one meeting with the applicant. Under the old setup, an applicant would have to apply separately for various forms of assistance. The agency also realized major cost savings in implementing a client/server setup.

"We'll see a cost savings of about $1.5 million the first year," with substantial savings each year just from cutting down on mainframe processing, Kidd said.

THE ENTIRE OFFICE WENT INTO SHOCK WHEN FOUR MAJOR PROJECTS WERE SUDDENLY PUT ON HOLD.

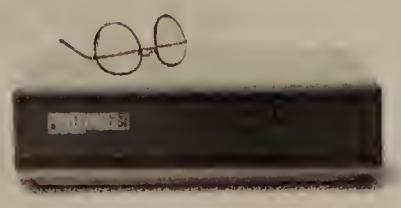
Management still refers to it as "Black Friday." The morning that every computer screen in the entire office suddenly went blank. And as hundreds of hours of manpower were lost in the blink of an eye, they kicked themselves for not having the foresight to buy a Powerware® System from Exide Electronics.

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THE RUNAWAY CASH SUCKER.

"Why didn't someone tell me this @$!?& network would cost so much?"

A lot of executives go pale when they see how much their computer networks are really costing them.

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Too late. They're strapped to a runaway cash sucker and heading downhill fast.

The fact is, the real economics of running a computer network are never even mentioned by the people trying to sell you one.

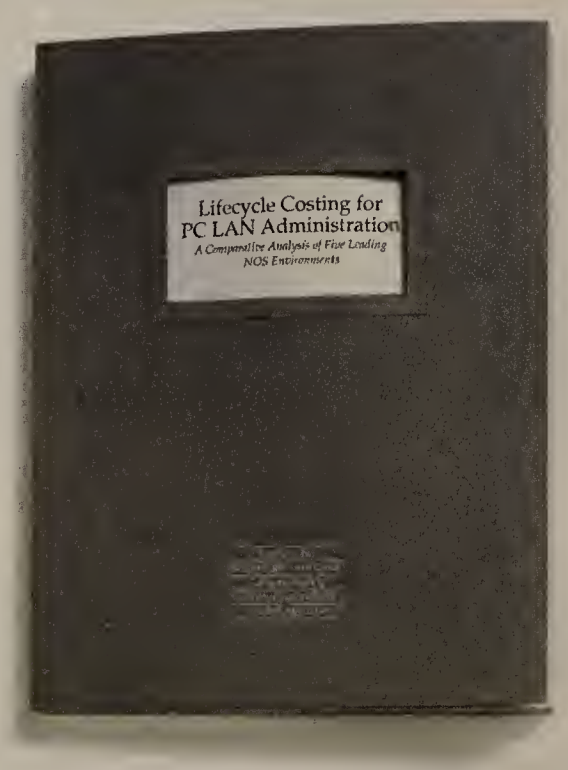
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It was compiled by the Business Research Group, and shows how Banyan,® Novell,® IBM,® DEC,® and Microsoft® stack up against each other in cost of operation.

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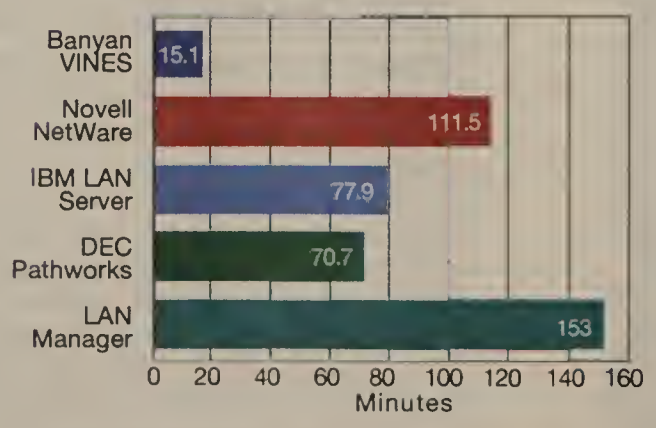
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Worth Noting

"Smart hubs are the spine of the enterprise LAN. They enable us to have a LAN strategy, not just LANs."

Lori Steinmetz
Data network manager
The Christian Science Publishing Society
Boston

Link Notes

Dowty Communications, Inc. recently unveiled a device for routing synchronous and asynchronous traffic over frame relay networks.

The **FPX2195 Frame Relay Access Device (FRAD)** has seven ports that can be configured to support synchronous or asynchronous traffic, one asynchronous-only port and two wide-area ports for linking to either frame relay or X.25 nets. The wide-area ports support rates from 2,400 to 64K bit/sec.

Available in the first quarter, the unit costs $5,995.

For more information, call Dowty at (800) 424-4451.

Cisco Systems, Inc. recently unveiled a 10Base-T transceiver that simplifies the connection of routers and terminal servers into unshielded twisted-pair Ethernets.

The **10BaseT Ethernet Transceiver Applique** is a board that fits in Cisco's routers or terminal servers. It provides unshielded twisted-pair ties to the AGS+, MGS and CGS bridge/routers, the CPT protocol translator and the ASM and MSM terminal servers. Previously, connection to these devices required an attachment unit interface port and an external transceiver.

Available 60 days after order, it costs $225 per port. For more information, contact Cisco at (415) 688-8200.

North Hills enters internet mart with spate of wares

Offers SRT bridge, MAU and net mgmt. system.

By Maureen Molloy
Staff Writer

SYOSSET, N.Y. — North Hills recently broke into the internetworking market with the introduction of a bridge that supports the emerging source routing transparent (SRT) standard.

The company also announced an intelligent multistation access unit (MAU) for token-ring local-area networks as well as a network management system for the two devices.

By supporting SRT, the new LBT4200 bridge is designed to support the transfer of both source-routed and nonsource-routed packets between LANs.

The stand-alone LBT4200 bridge, which is capable of interconnecting two token-ring LANs, detects the path information for source-routed data from the frame's Router Information Field and forwards data based on that information.

The LBT4200 also performs transparent bridging based on the Spanning Tree Algorithm, which enables the bridge to be implemented in a closed-loop topology to support multiple paths between LANs without packet duplication.

The LBT4200, which can be monitored through IBM's LAN Manager and NetView, costs $4,500 and is available now.

Multipurpose MAU

The MAS LAT4000 Multimedia Access System is an intelligent MAU that supports as many as eight 12-port interface cards in a rack enclosure. The product also supports a variety of media types running within the token-ring LAN at 4M and 16M bit/sec, including any mixture of fiber-optic, single coaxial, shielded twisted-pair and unshielded twisted-pair cable.

The MAS LAT4000 connects as many as 96 nodes in a star configuration. Additionally, the device is equipped with a backup power supply in the event the primary unit fails.

The hubbing unit supports such IBM protocols as the Network Management Vector Transport protocol implemented by IBM on its Controlled Access Unit 8230 and LAN Network Manager,

(continued on page 18)

Firm offers inexpensive hub options

By Joanne Cummings
Staff Writer

SAN JOSE, Calif. — The AQUILA Network Products Division of ADI Systems, Inc. recently announced a low-cost, 13-port 10Base-T card that can be configured as either a managed or unmanaged hub for Novell, Inc. NetWare or IBM Network Basic I/O System local-area networks.

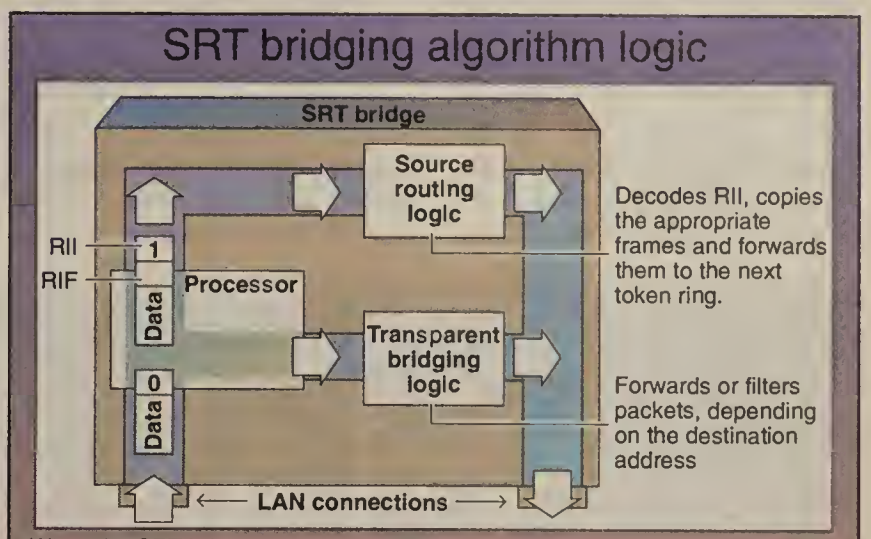
For less than $1,500, or about $125 per port, users can purchase an intelligent hub that comes with a Simple Network Management Protocol package, providing buyers with the benefits of a high-end system without the cost, according to Raymond Hou, ADI's executive vice-president.

"This hub combines the best features of entry-level hubs and high-end concentrators," he said.

The AQ-IHUB-12TP is an 8-bit Industry Standard Architecture bus-based controller card that resides in any nondedicated IBM Personal Computer or PC AT. It has 12 RJ-45 connectors that link 12 workstations to the hub via 10Base-T unshielded twisted-pair wiring. The card also has a BNC connector to link one workstation or server via 10Base2 coaxial cabling. As many as four controller cards can reside within the same PC, according to the ADI division.

The hub can be configured as a managed hub in two ways. First, it can be managed by LanExec, ADI's new SNMP-based management system. The host PC must also contain a net interface card (NIC) supported by that management system. These cards include Novell's NE1000 and NE2000, 3Com Corp.'s 3C503 or any AQUILA- or ADI-certified card. The NIC holds the LanExec

(continued on page 51)



When the SRT bridge detects an RII within the frame, it recognizes that an RIF will follow and source routes the frame through the network. In the absence of an RIF, transparent bridging is performed.

RIF = Routing Information Field
RII = Routing Information Indicator
SRT = Source routing transparent

SOURCE: INSTITUTE OF ELECTRICAL AND ELECTRONICS ENGINEERS, INC., PISCATAWAY, N.J.
GRAPHIC BY SUSAN J. CHAMPENY

New IEEE standard to bridge LAN gap

Source routing transparent algorithm promises to let users link Ethernets, token rings via one bridge.

By Maureen Molloy
Staff Writer

The IEEE 802.5 committee is nearing completion of a new bridging standard that eventually will enable users to link Ethernet and token-ring LANs via a single bridge.

The source routing transparent (SRT) algorithm is a hybrid between the transparent bridging technology used primarily to link Ethernets and source routing, which is used to link token-ring nets. Before SRT, local-area networks using the different bridging schemes could not communicate.

Since an SRT bridge supports both bridging methods, source routing and transparent bridging network devices can now coexist, thereby reducing the cost of maintaining the LAN internetwork by eliminating multiple bridges and separate lines to support the different traffic.

"The premise is that all bridges in a nonhomogeneous network will ultimately migrate toward SRT," said Kirk Preiss, editor of the IEEE's 802.1D SRT Bridging Appendix and the standards project authority for LANs at IBM. "If all bridges support SRT, then there's effectively only one type of bridge in the user's entire network."

Transparent bridges are so-named because they are transparent to end stations on a LAN and determine the location of LAN devices by learning the layout of a network and building a database of each device's address. The bridge relays messages on the basis of the node addresses in this database, or forwarding table.

Source routing, on the other hand, requires that the sending node, or source node, and not the bridge, supply the information needed to deliver a frame to its intended recipient.

SRT differentiates between source-routed and non-source-routed LAN traffic on a frame-by-frame basis. If the packet is source routed, the bridge forwards it as such. If it is a transparent bridging packet, the bridge determines the destination address and processes it as an Ethernet packet.

The SRT algorithm is currently a draft standard in the IEEE and is expected to be ratified by the end of the year, Preiss said.

The decision to implement SRT is not an issue for users who restrict their bridged LANs to Ethernet only or for users whose network consists exclusively of token-ring LANs.

But in network configurations that consist of mixed LANs or a newer media, such as Fiber Distributed Data Interface, the user may have both source routing and transparent bridges in the same bridged LAN. When this happens, full or partial loss of connectivity could result due to

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IEEE standard to bridge LAN gap

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the nonhomogeneous nature of the bridged LAN network. Users could opt to resolve the discrepancies by modifying source routing or transparent bridges, but experts said that can lead to far worse problems such as increased overhead, packet duplication and broadcast storms.

One early effort was to use an encapsulating bridge that takes a frame destined for a device on another LAN type, wraps it in an envelope and transmits the encapsulated frame to other bridges for delivery.

Another method is to use a translating bridge that manipulates the frames associated with each LAN type, each of which are of different length. Since a translating bridge cannot fragment frames, each individual LAN device must be configured to transmit messages of a fixed length.

The SRT algorithm was thus developed to enable different LAN types to function harmoniously in the same net by more easily accommodating the divergent methods in which Ethernet, token-ring and FDDI data packets function across bridged LANs.

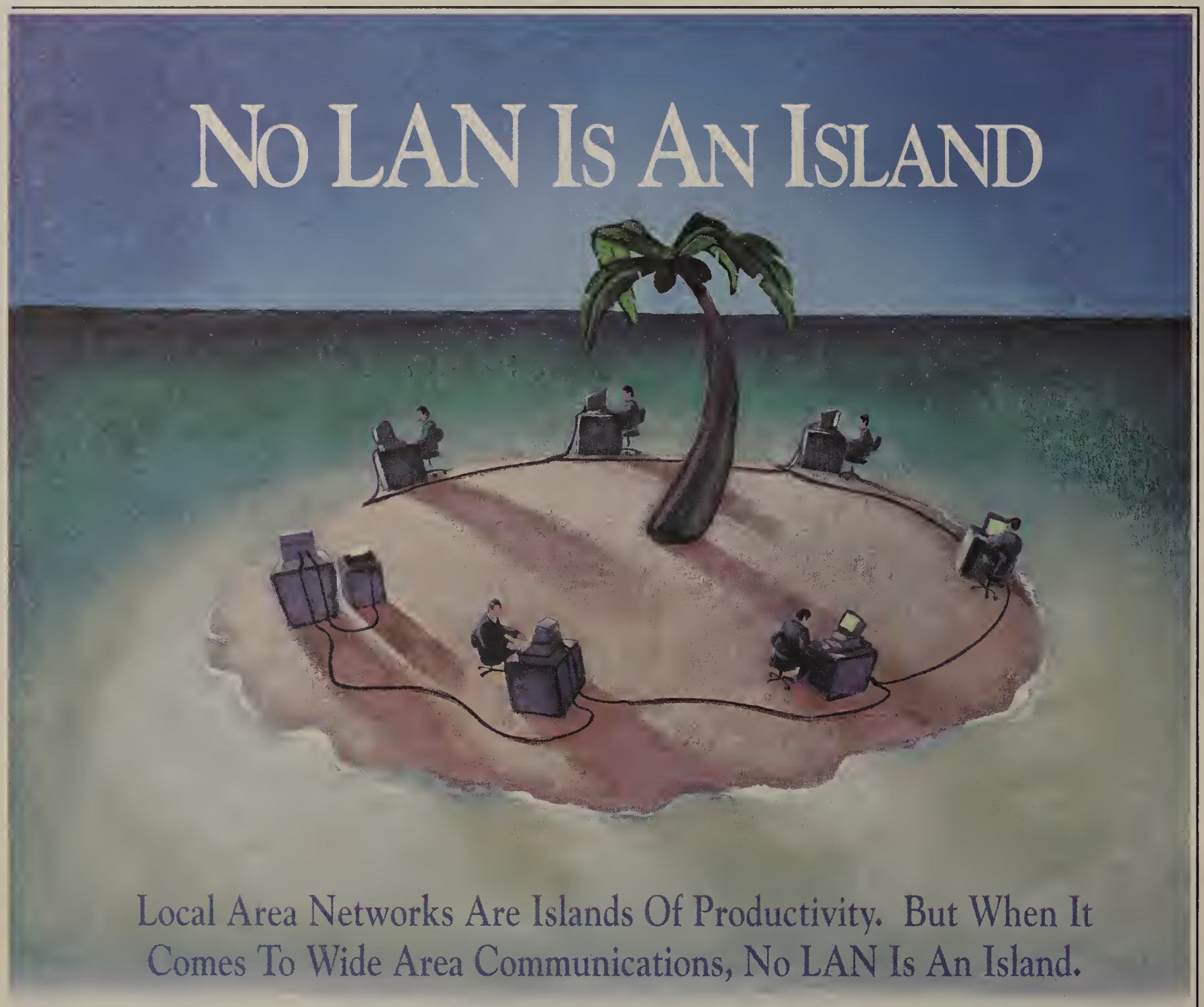
Key to the source routing portion of an SRT bridge is the existence of a Routing Information Field (RIF) and a Routing Information Indicator (RII) within the frame. The token ring-attached station from which a frame originates will designate the route that the frame will travel by imbedding a description of the route in the RIF of the transmitted frame.

The RII consists of a single bit in the source address header of the data frame. If the RII is set at 0, this indicates to the SRT bridge that there is no RIF contained within the frame and, therefore, the bridge treats it as a nonsource-routed frame. If the RII is set at 1, the SRT bridge knows that an RIF will follow and will source route the frame through the net (see graphic, page 17).

In operation, two bridging algorithms — source routing and transparent bridging — exist within the SRT bridge's media access control layer. The bridge is capable of performing source routing when frames are received with routing information following the source address.

A spate of vendors recently announced SRT support on their bridge and bridge/routers, including Andrew Corp., CrossComm Corp., FiberCom, Inc., Microcom, Inc., Netronix, Inc., North Hills and Wellfleet Communications, Inc.

Cisco Systems, Inc., IBM, Proteon, Inc. and Vitalink Communications, Inc. will support SRT in future software releases.



Firm enters internet mart

continued from page 17

as well as the Simple Network Management Protocol.

The MAS LAT4000 costs $135 per port and is available now.

Event management

LANorama, which is a personal computer-based event reporting management system that controls the company's bridge and MAU, was also unveiled.

It detects and reports software and hardware problems in real time via a graphical user interface running under Microsoft Corp. Windows 3.0.

By correlating the hardware and software alerts, network administrators can pinpoint trouble areas and avert network downtime.

LANorama supports SNMP and IBM's Heterogeneous LAN Management standard, as well as in-band and out-of-band connections to the MAS LAT4000 for providing more redundant management capabilities.

Additionally, a LANorama module called Early Systems Hazard detects and alerts users to status changes or malfunctions within the token-ring network before problems occur.

Available now, LANorama is priced at $12,000.

LANorama detects and reports software and hardware problems in real time.

▲▲▲

Worth Noting

The U.S. market for call accounting systems grew from $204 million in 1990 to more than $241 million in 1991, according to a recent study from The Ergotec Group, a Seattle research firm. The largest growth was garnered by personal computer-based systems, which accounted for more than $64 million in sales last year.

Regulatory Update

The U.S. is making headway in bringing down international accounting rates for switched voice services, the **Federal Communications Commission** stated in a recent report. The imbalance in international accounting rates has become a thorny political problem, given the current U.S. deficit of about $3 billion on international calls. There are more calls going out of the U.S. than coming in, and foreign countries often charge more to terminate calls in their service areas than do U.S. carriers.

The FCC report indicated that during the past six years, carrier efforts have yielded 300 reductions in international accounting rates, each averaging between 30 and 50 cents. International rates started to fall in 1988 and have dropped slightly each year since then.

Rate reductions have varied according to world region. The FCC report indicates that countries in the Pacific region have dropped rates the most during the six years.

Michigan Bell rolls out caller ID

Service:	Caller ID
Availability:	Now
Region:	Detroit and surrounding communities
Customers:	1 million businesses and residences
Features:	Free per-call blocking
Charges:	$6.50 a month per line, which includes delivery of phone numbers with the first 300 incoming calls. A charge of 2 cents for each number above the base allotment is also assessed.
Promotions:	During the first 30 days that the service is available in any area, Michigan Bell will waive the onetime start-up fee of $7.50.

GRAPHIC BY SUSAN J. CHAMPENY — SOURCE: MICHIGAN BELL TELEPHONE CO., DETROIT

Mich. Bell offers caller ID service with call blocking

Major user pleased with availability of service.

By Bob Wallace
Senior Editor

DETROIT — Michigan Bell Telephone Co. this week will begin offering caller identification to more than one million businesses and residences here.

The carrier is planning to offer a free per-call blocking feature to satisfy caller ID opponents that claim the service is an invasion of privacy.

"It's great that caller ID is coming to Detroit," said Dan Gonos, a longtime caller ID backer and telecommunications manager for Domino's Pizza, Inc. in Ann Arbor, Mich. "We've got 110 stores in metropolitan Detroit that could use the service."

Gonos is also an officer of the National Centrex Users Group, an organization with 750 member companies that last year released a position paper supporting caller ID, making it the first user organization to back the service.

Whose pizza?

Domino's is looking to caller ID to reduce the $5.1 million worth of bad orders it had in 1991. The number of such orders at 300 of its 4,800 stores that use caller ID has already plummeted by more than 90%, according to Gonos.

Michigan Bell said its research showed that caller ID would be the most popular of the handful of custom local-area signaling services supported by Common Channel Signaling System 7. Other class offerings researched by the carrier included call trace and distinctive ringing.

Michigan Bell's caller ID service will initially be available in some areas here as well as in surrounding communities.

The carrier said it "drew on recommendations from a broad-based panel representing consumer, law enforcement, public service and senior citizen organizations in formulating a plan for the caller ID service."

Call blocking issue

Michigan Bell could have offered the service without call blocking but would have risked having state regulators order free blocking, as was the case in California and Florida.

"As a corporation, Domino's remains opposed to per-call blocking," Gonos said. "We won't deliver orders from callers who block transmission of their telephone numbers in states where we use caller ID."

Domino's stores in Maryland, Nebraska, New Jersey and Tennessee already use caller ID.

Michigan Bell will charge customers $6.50 a month per line for caller ID, which includes delivery of the first 300 telephone numbers (see graphic, this page).

Delivery of additional numbers cost 2 cents each. The carrier will waive the service's $7.50 onetime start-up charge per customer for the first 30 days that the service is available in any given area.

Michigan Bell will refer customers to companies that sell the add-on devices that display the caller's telephone number. The units can be purchased at area retail stores for $40 to $135.

U.S. fiber net could be a boon for users

Advocates push for broadband network, which holds the promise of boosting U.S. productivity.

By Anita Taff
Washington Bureau Chief

WASHINGTON, D.C. — A study released last week suggests U.S. businesses could greatly improve productivity and add about $321 billion in gross national product growth over the next 16 years if they gain access to a nationwide broadband network rather than relying on private nets.

The study, which was produced by the Economic Strategy Institute (ESI), a nonprofit think tank here, emphasizes the need for a broadband net that would be based on fiber optics and supporting T-1 speeds and above.

Such a public net could be used to support a host of applications ranging from imaging and videoconferencing to communications between remote plant floor operations. Although the report came from an independent research group, Sen. Conrad Burns (R-Mont.) last week endorsed the study, which lends support to a bill he introduced last year to build such a network.

Burns said other countries, such as Japan, are on a fast track to build a national fiber-optic network that would reach all businesses and homes by the year 2015 and that if the U.S. does not have access to a similar facility, the country will fall behind in a global economy. Other proposals for a nationwide net have focused more on connecting large research facilties and firms engaged in defense work.

U.S. carriers are already installing large amounts of new fiber-optic facilities, but they will not approach the capabilities of the planned Japanese broadband network until the year 2040, according to Clyde Prestowitz, ESI's founder and president.

Although some have criticized the national broadband network idea as coerced industrial planning, Prestowitz disagrees. By setting up laws and regulations that — in Prestowitz's opinion — could inhibit investment in new

(continued on page 20)

Ascend extends range of inverse mux distribution

By Bob Wallace
Senior Editor

ALAMEDA, Calif. — Ascend Communications, Inc. last week announced plans to provide its Multiband Bandwidth-on-Demand Controllers to users in parts of Asia, Australia and Europe.

The inverse multiplexers can be purchased through distributors or resellers in Australia, Belgium, France, Japan, Taiwan and the U.K. for use with Integrated Services Digital Network services in those countries.

The Ascend mux builds high-speed switched connections by combining 56K or 64K bit/sec channels into a virtual data stream that can support data transmission up to 1M bit/sec.

Ascend's inverse multiplexer is designed to support high-speed data communications applications, including videoconferencing, local-area network interconnection and disaster recovery for private nets.

GPT, Ltd., the U.K.'s leading telecommunications equipment supplier, has signed an OEM and distribution agreement with Ascend to offer the muxes in its home country.

France Telecom's France Cables and Radio subsidiary will begin distributing muxes by mid-year, while IAT N.V. will sell the product in Belgium, and Kokusai Denshin Denwa Company, Ltd.'s Telecomet International unit will sell the product in Japan.

Scitec Communication Systems, Ltd., a company that develops, builds and distributes networking products, will sell the unit in Australia, while Taicom/Leadmark Industries Company,

(continued on page 20)

Ascend extends range of mux distribution

continued from page 19

Ltd., an equipment maker based in Taiwan, will sell the inverse multiplexer in its country.

Rob Ryan, an Ascend founder and the firm's chief executive officer, said the foreign distribution channels will complement those that the vendor has established in the U.S. Ascend has set up marketing arrangements with each of the Big Three long-distance carriers.

The Multiband Controller can, for example, build a switched circuit comprising six 56K or 64K bit/sec channels between New York and London. The dial-up link can be used for about four to seven hours a day before a 384K bit/sec fractional T-1 line can be justified, Ryan said.

Ascend also announced that it recently completed a fourth round of financing that secured $8 million from Chancellor, a U.S.-based venture capital firm.

Founded in 1988, Ascend began shipping its inverse multiplexers in May 1991.

U.S. fiber net could be boon for users

continued from page 19

broadband technologies, the U.S. has a policy by default.

"We have a de facto industrial policy . . . and that industrial policy effectively is picking us to be the loser [globally]," he said.

The ESI study was based on interviews with companies and state governments across the U.S. that currently use broadband applications. The group then applied those results to statistical formulas to estimate the impact if all businesses in the country had access to similar capabilities from the public switched net.

Prestowitz said that, although private networks have been effective so far, they are too expensive and complicated for all businesses to develop. He advocates giving local and long-distance providers incentives to install broadband technology in the public switched network.

Although critics of such a network say that telephone rates would skyrocket to pay for a national fiber-optic network, it would be cheaper for businesses in the long run, according to Robert Cohen, author of the ESI study. Local and long-distance carriers currently spend about $20 billion annually on network technology, but most of it is older generation equipment, he added.

By just redirecting and speeding investment in broadband facilities, the carriers could build a new network without raising costs for end users, Cohen said. However, he did admit that, at least initially, businesses might have to bear a slightly larger share of the cost because they will likely be users of many broadband applications early on.

"The corporate part of the rate base might have to bear an increased part of the charges," for the new network, Cohen said.

Although almost all businesses would benefit from such a network, Cohen said some would benefit sooner than others. Among the industries expected to get an initial boost are computers, electronic components, communications services and equipment, radio and television equipment, printing and publishing, wholesale trade, plastics, finance, insurance and real estate.

Among the private broadband network projects studied for the ESI report are an imaging network installed by The Putnam Companies, a financial firm in Boston; an imaging-based claims processing system installed by Empire Blue Cross and Blue Shield in New York; a T-1 network used by Sears, Roebuck and Co. to process its Discover Card accounts; a T-3 fiber network run by the state of Oklahoma to carry video instruction to students in rural areas; and a broadband interactive network used by Johns Hopkins Medical Center in Baltimore.

The ESI study and Burns' bill envision a national network, likely built of fiber-optic cable, that carries all communications — voice, data and video — into every home and business in the U.S. For this to happen, a number of changes in current law and regulations would have to occur.

For example, Cohen said that the government must revamp current depreciation rules to allow carriers to more quickly write off older equipment and install newer generation technology.

Additionally, Cohen said that the bans in the Modified Final Judgment preventing the regional Bell holding companies from manufacturing pose a problem.

"The [MFJ] has a chilling effect on Bellcore [the research arm of the RBHCs] from collaborating closely with telecommunications manufacturers," he said. "Real integration of the shop floor and Bellcore to improve and refine equipment is off-limits."

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Worth Noting

As expected, start-up Edify Corp. recently announced the Edify Information Agent, a network tool that uses electronic mail, terminal emulation and voice response to satisfy user queries for data scattered across multiple systems.

Store & Forward

Action Technologies, Inc., a privately owned software developer in Alameda, Calif., recently announced a strategic partnership with **Da Vinci Systems Corp.** of Raleigh, N.C., to develop work flow software products.

Work flow is an emerging software technology that uses messaging and other technologies to automate the transport of documents to various individuals in an organization.

A classic example is the automation of expense reports. The work flow can deliver an expense report from the individual who generates it to the departmental administrator who reviews the report and then to the accounting department that issues a check.

Sterling Software, Inc.'s Ordernet Services division recently announced a joint agreement with **American Software, Inc.** to develop applications that incorporate real-time electronic data interchange technology.

Real-time EDI is an emerging technology for the instantaneous, electronic delivery of invoices and other documents between trading partners.

Real-time EDI systems enable a firm to receive an invoice as soon as it is transmitted from a trading partner.

Firm offers new insight into LAN-based imaging

New software supports high-resolution images.

By Barton Crockett
Senior Editor

SAN ANTONIO, Texas — Image Data Corp. last week unveiled software that enables users to build imaging services onto IBM NETBIOS LANs and integrate high-resolution images into existing applications.

Analysts said the new Insight software is the only image system available today that is optimized for high-resolution, photographic images. Other imaging systems, by contrast, are designed to support lower resolution document images.

"[Insight] can generate some compelling benefits in some applications," said Mike Howard, program director for the Office Information Systems unit at Gartner Group, Inc., an information technology consultancy in Stamford, Conn.

Insight consists of two software components — the Insight Image Control System (ICS)/386 and the Insight Image Server (IIS)/4000.

ICS/386 runs on 80386-based personal computers positioned as client workstations on a Network Basic I/O System local-area network and interacts with user applications to trigger requests for files from the image server.

IIS/4000 consists of software bundled onto an 80486-based PC, which can be positioned as a dedicated image server on the LAN. It provides a database for large, high-resolution images that can be accessed by multiple users on a NETBIOS LAN.

Images are entered into the network via an Insight Capture Kit, which is a card and software for 80386-based PCs that digitize and compress images fed from external devices, such as cameras or scanners.

ICS/386 software decides whether to store the image on a client or server using parameters programmed by an application developer. Once an image is stored, Insight assigns it a unique, 64-bit location code that is used to retrieve an image from

(continued on page 23)

X.400 use increasing on Internet

By Wayne Eckerson
Senior Editor

MADISON, Wis. — Working hand in hand with European experts in public X.400 messaging, U.S. users are making slow but steady progress in increasing the use of X.400 on the U.S. portion of the Internet.

Currently, most messaging on the Internet is based on the Simple Mail Transfer Protocol (SMTP), which runs over Transmission Control Protocol/Internet Protocol-based nets and supports limited messaging functionality.

But some users are trying to spur usage of X.400, which is an international messaging standard that specifies many advanced features that many believe will make it the message vehicle of choice.

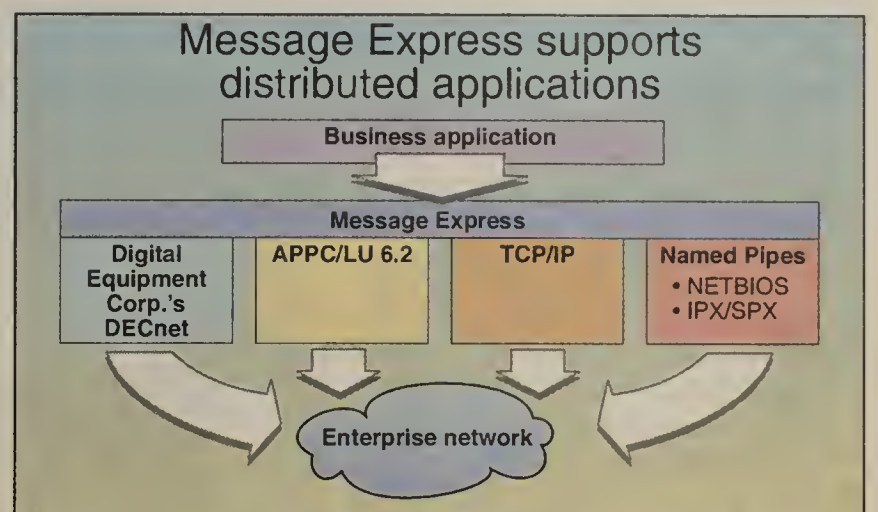
The University of Wisconsin has already established a pilot X.400 network on the Internet using grant money from the National Science Foundation (NSF).

Currently, 18 organizations — including universities, research laboratories, vendors and user companies — are working with the X.400 pilot network, which the University of Wisconsin runs as a private management domain (PRMD) on the Internet. The PRMD is called the X.400 National Research Education Network (XNREN).

Researchers from the university and others involved in the XNREN project have been working closely with the Internet community and European X.400 specialists to establish administrative procedures and agreements for running a high-volume X.400 research network.

XNREN currently handles about 10,000 messages a month. In contrast, the European Research and Education X.400 network, which has been funded by the Commission of the European Communities, supports 100,000

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Message Express running on different platforms and operating systems facilitates deployment of distributed applications by acting as an interface to various communications protocols on the enterprise network.

GRAPHIC BY SUSAN J. CHAMPENY — SOURCE: HORIZON STRATEGIES, INC., NEEDHAM, MASS.

Distributed net pack looms on horizon

Message Express to provide common API, net functions for emerging distributed applications.

By Timothy O'Brien
West Coast Bureau Chief

NEEDHAM, Mass. — Start-up Horizon Strategies, Inc. today will unveil software that can manage communications links among distributed applications in a multiprotocol network.

The company's Message Express is an application program interface (API) and associated software that a developer integrates with a distributed application to establish peer links from a workstation or server to other systems on a network.

Until now, developers building distributed applications have faced the formidable task of writing custom instructions — sometimes thousands of lines of code — that specify how the application passes the request to specific systems across the net.

Instead, Message Express will act as middleware, an emerging class of software products that provide a common set of routines to handle requests from an application and initiate processing between different computers on a network, regardless of the underlying net protocols.

"There's a certain level of independence that Message Express gives my applications," said Peter Walker, vice-president of electronic data processing and information systems at Munich Reinsurance Co. of Canada. "The interface is the same on each platform, so I can utilize my programmers for developing the application itself, without worrying about any communications."

To insulate application developers from spending months on network protocol issues, Message Express provides a common API that links the application to the various network transport services needed to reach other devices on the net.

Without the software, for example, a programmer writing an application to support IBM's LU 6.2 protocol would need to deal with 32 programming verbs and potentially as many as 1,400 possible error conditions in order to develop the application.

Message Express reduces the number of programming routines and error conditions that the application has to support across the different systems on the network.

Developers who are writing applications simply issue a SEND request to the Message Express API — which provides the same interface on all platforms — to coordinate the necessary communications services required for sharing information among various systems on a network.

Initially, Message Express will be available to run on IBM mainframes and mid-range computers, Digital Equipment Corp. VAXes, local-area network-based personal computer servers and workstations, Unix servers and workstations, or PCs.

To satisfy information requests, Message Express will be capable of supporting various

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X.400 use increasing on Internet

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users and handles hundreds of thousands of X.400 messages a month, according to Rob Hagens, associate researcher at the University of Wisconsin here who helped initiate the XNREN project.

While traffic volumes and user interest is less than Hagens and other XNREN founders anticipated, most are optimistic about the future.

"We are making slow but steady progress," said Kevin Jordan, senior software engineer at Control Data Corp., which uses XNREN to send X.400 messages to clients in Europe. "Other research networks, such as Internet and Bitnet, started slowly, but eventually took off once users got connected."

More users will participate in XNREN once commercially available X.400 software offers greater functionality than SMTP, such as support for multimedia messaging, said Allan Cargille, associate researcher at the University of Wisconsin, who assists Hagens with the pilot XNREN network. Until then, most U.S. users will continue to use SMTP because they are familiar with it, and it is less complicated than X.400, Cargille said.

Laying the infrastructure

Although it may take several years for X.400 to make significant inroads in the U.S. portion of the Internet, XNREN has made considerable progress in laying the administrative and operational infrastructure needed to manage a large X.400 research network.

Much of this work has been done in conjunction with the Internet Engineering Task Force (IETF), which establishes standards and procedures for communications on the Internet. Many of the participants in the IETF are Europeans who have extensive experience running Open Systems Interconnection networks, Cargille said.

Hagens and Alf Hansen, a communications specialist at Uninett Co. in Norway, established the IETF's X.400 Operations Working Group, which is defining the requirements for establishing a PRMD, methods for interconnecting PRMDs and ways to manage multiple implementations of X.400 on the Internet.

The X.400 Operations Working Group is developing objects that define how management domains exchange X.400 messages. The objects define information such as PRMD addresses, port configurations, network layer protocols and addresses of users whose mail the PRMD will accept.

The group has decided that PRMDs will be able to interconnect directly instead of having to go through nation-specific gateways. Also, the group has decided that management domains using different X.400 implementations will exchange messages through a third management domain that will serve as a gateway.

The X.400 group recently spun off another working group that will define how to use X.500 directory services to support X.400 messaging. That group will determine how to use X.500 directories to store data that management domains need in order to exchange X.400 messages, such as names, addresses, routing tables and PRMD connection data.

The use of X.500 directory services will replace the static routing tables that XNREN and most European management domains currently use. These tables are stored on a PRMD host computer and are updated on a regular but infrequent basis. Users in the PRMD download the routing tables to their own computers in order to get up-to-date addresses and routing tables, Jordan said.

In addition to formulating operational methodologies and procedures, XNREN has used NSF grant money to develop new X.400 capabilities for the Internet. XNREN has developed an X.400-to-SMTP electronic mail gateway, which currently handles about 8,000 messages a month. It also recently built an E-mail-to-facsimile gateway that enables XNREN participants to send fax messages anywhere using their X.400 messaging application, Hagen said.

XNREN is also building a message transfer agent (MTA) or Internet messaging node that will enable XNREN members to send X.400 messages across the Internet using the full seven-layer OSI stack. Currently, XNREN participants send X.400 messages on top of TCP/IP using a standard specified by the IETF called Request For Comment 1006, which allows TCP/IP to support X.400 and other upper layer OSI protocols.

Hagens said the new MTA service will support full OSI implementations running transport layer Class 4 service (TP4) and network layer connectionless service. He said he expects the service to come on-line in the next month.

XNREN is trying to persuade regional NSF networks to support X.400 messaging using the full OSI stack, Jordan said. Most of the regional NSF networks added this



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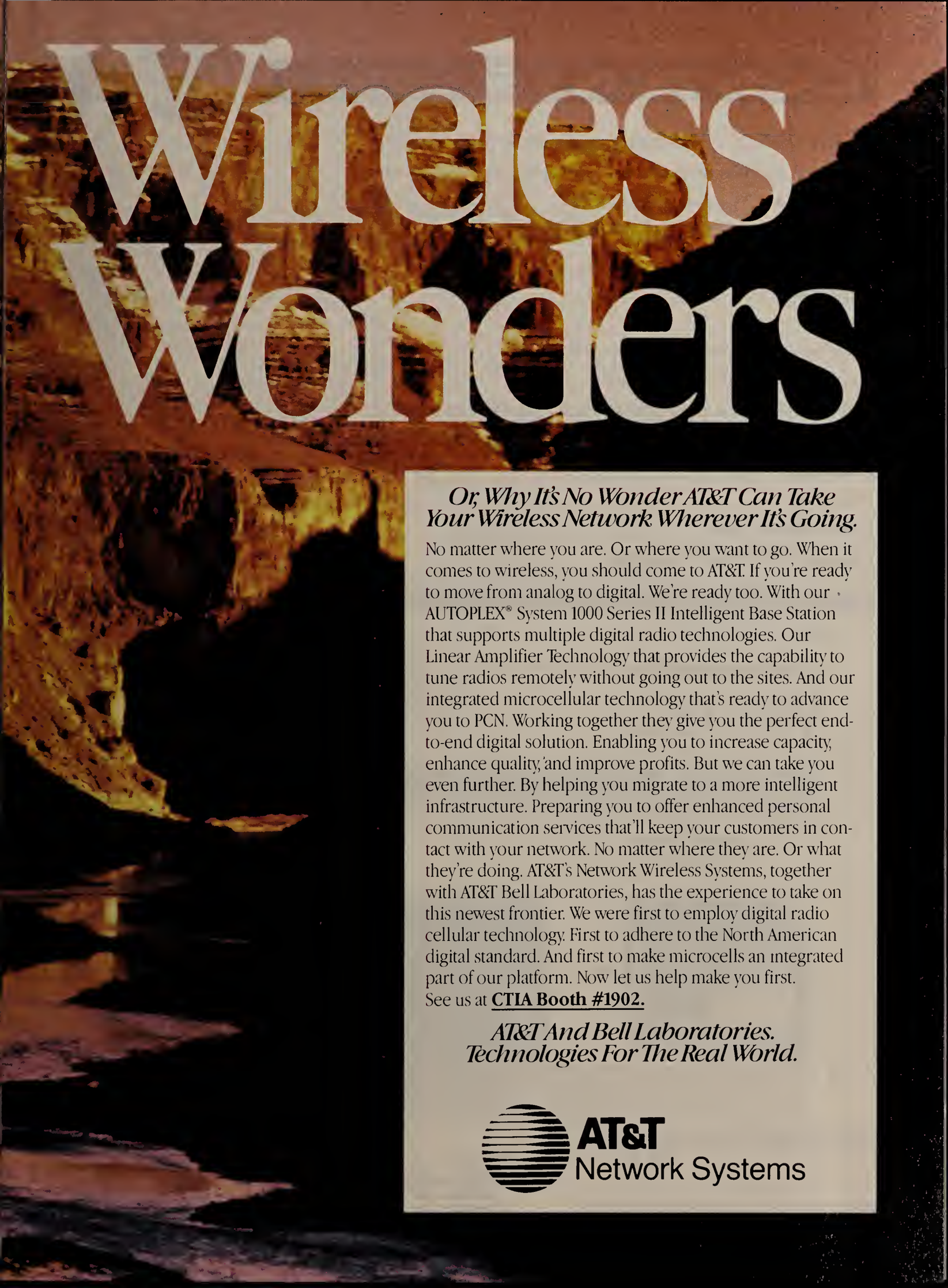
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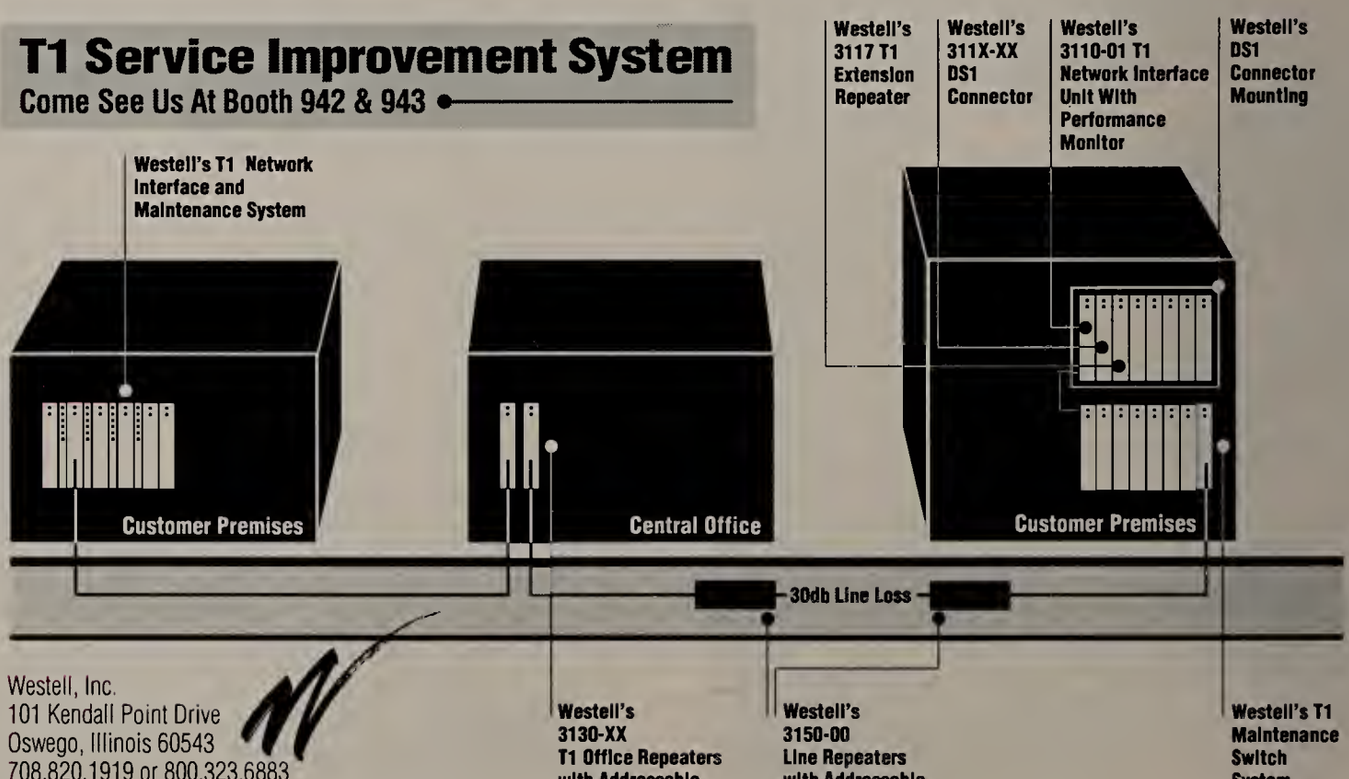
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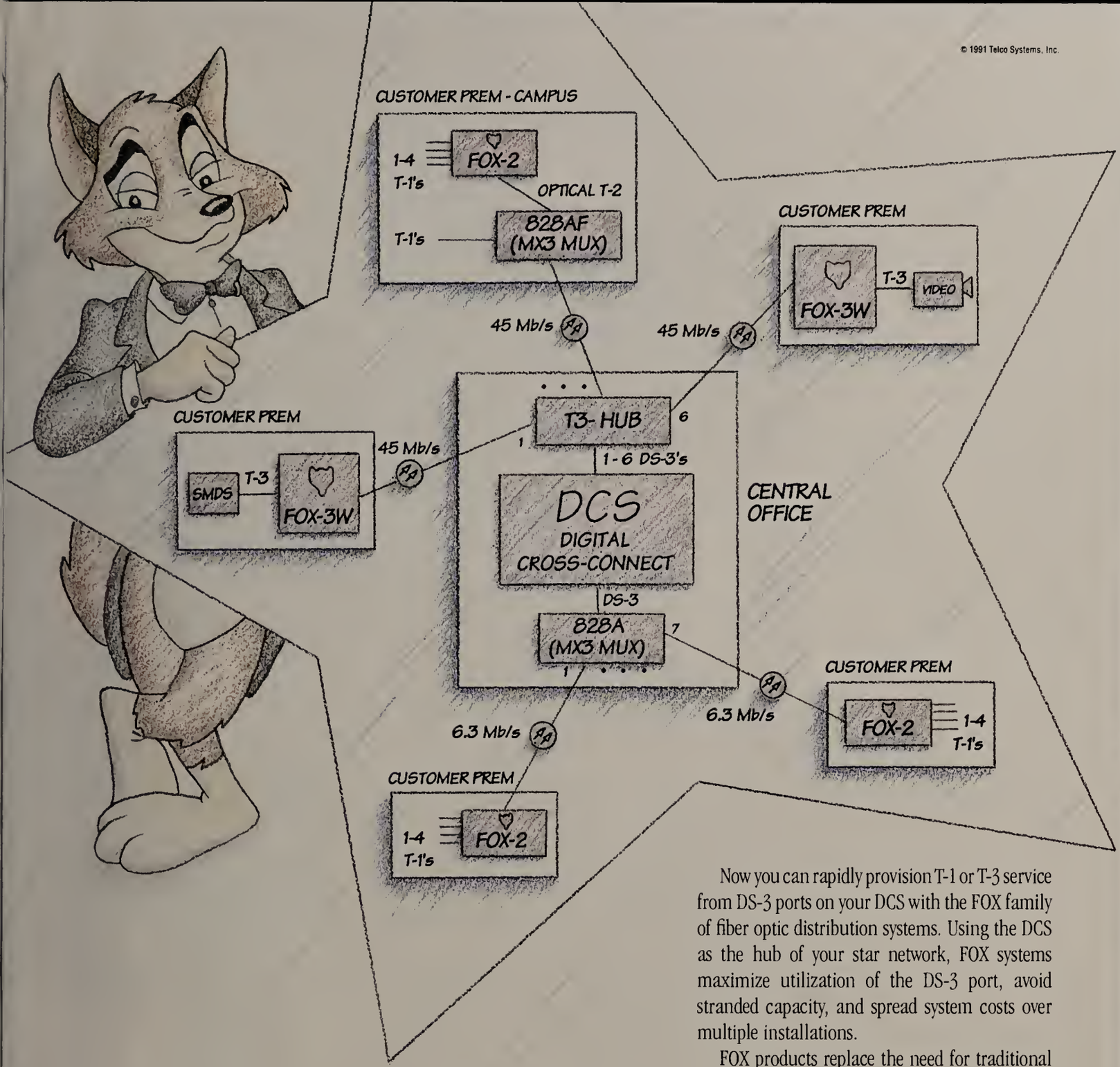
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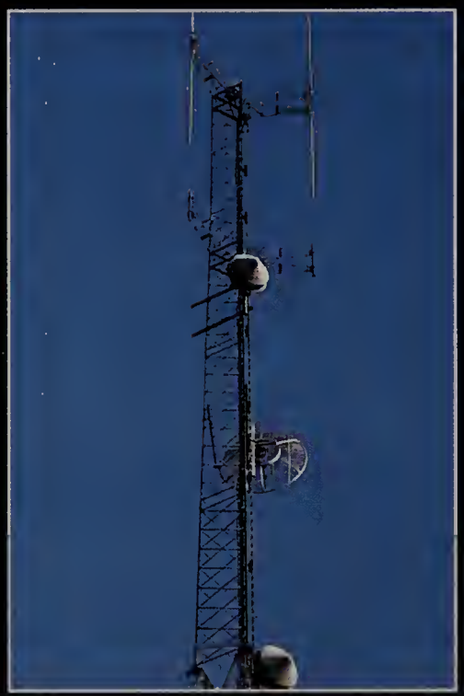
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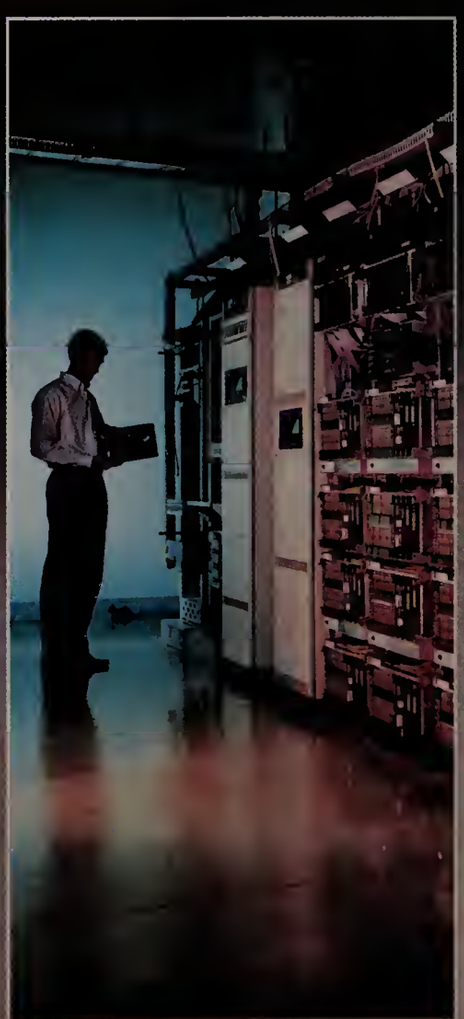
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SUPERCOMM/ICC '92: Why you should be there

Join us in Chicago for an extraordinary event that offers something to everyone in the telecommunications world. We live in a time when everything around us—from the routine of banking and shopping to the incredible completion of a high-tech war in just a matter of weeks—is impacted by telecommunications. It is increasingly important that those of us who work in an industry that touches so many lives become as knowledgeable and current as possible. Here is your best opportunity this year.



John Sodolski
President
U.S. Telephone Association

The SUPERCOMM Conference and Exhibition is Monday through Thursday, June 15-18 at McCormick Place. Once again, as it was two years ago, it is co-located with the International Conference on Communications and ICC's Monday through Wednesday programming.

Where else can you find break-through technology covering 400,000 square feet and two premier conferences under one roof? SUPERCOMM celebrates its fifth anniversary this year with an established reputation for professionalism. Begun as a joint project of manufacturers and suppliers (Telecommunications Industry Association) and local telephone companies (United States Telephone Association), it has grown into a meeting ground for a variety of people with telecom-related interests as both products and methods of delivery have expanded into cellular, paging, cable, etc. And, it now also has substantial appeal for people who manage telecom services for businesses, institutions and governments.

From all the above ranks come members of the Communications Society of The Institute of Electrical and Electronics Engineers. When this group's ICC event joins SUPERCOMM, the dimension of research is added, as well as a more international flavor. Whatever your background, you are certain to find among the 20,000 registrants a good many resources for sharing ideas.

Mornings begin with general sessions and speakers of note. Then SUPERCOMM features more than 40 free seminars of a practical, hands-on nature for those who market, manage, operate and use telecom services. The ICC program offers more than 85 additional sessions of a more technical nature that are designed with varying levels of depth. Included is a separate track of 21 sessions designed especially for SUPERCOMM attendees to bridge the gap between practical applications and research. Then, of course, there is the exhibition that serves as the most convenient laboratory possible.



Allen R. "Mike" Frischkorn Jr.
President
Telecommunications Industry Association

This year's centerpiece display will feature SuperSchool, sponsored by Ameritech. Experience an interactive, hands-on exhibit that will showcase telecommunications technology in voice, data and video. Ameritech, in conjunction with USTA, TIA and IEEE, will provide you with real technology that exists today, so that you may see how it will work in the business world of tomorrow.



Douglas Lattner
Chairman
ICC '92

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Seminars, exhibits offer show attendees a host of choices

Attendees to SUPERCOMM/ICC '92 can take advantage of two distinct but complementary learning paths. Attendees can choose among a variety of seminars offering valuable insights into telecommunications for sophisticates and beginners alike. Attendees also can walk the busy SUPERCOMM floor on which the industry's leading vendors will display the latest and best in telecommunications technology. Best of all, SUPERCOMM is structured so attendees can do both at no charge.

Choices—they could be agonizing to make when confronted with as much as SUPERCOMM has to offer if everything were not so well planned. The sponsors have learned a good deal since launching the event in 1988, however, and have put what they know to good use. For example, the SUPERCOMM conference now begins a day prior to the exhibits, thereby allowing booth personnel a chance to take in some seminars and simply offering more information to all attendees, especially basic information.

In years such as this when the event is co-located with the International Conference on Communications, that program also begins on Monday. Sponsored by the Communications Society of The Institute of Electrical and Electronics Engineers, the ICC program offers a special series of sessions designed for SUPERCOMM attendees. Note there is a moderate fee for these.

Throughout the SUPERCOMM conference, seminars have been scheduled to permit as much pursuit of particular subject matter as possible without conflicts, as well as plenty of time to see classroom experiences come to life on the exhibit floor.

SUPERCOMM involves no fees, tickets or hassles. Just be certain to preregister so your name badge can be mailed to you ahead of time. Then proceed planning your stay, circling your choices on the grid on page 30A and perhaps taking a few clues from the following.

International interests fill the day on Monday, so one can begin with the European cellular market, move on to a global investments "report card" and then feel thoroughly prepared for an afternoon that zeroes in on growth in Asia, the Pacific Rim, and the Caribbean and other Southern Hemisphere markets.

End user sessions also make for a complete day on Monday, beginning with an overview session on needs, followed by others that establish working knowledge about public, private and hybrid networks that will serve telecom/MIS managers well throughout the week. A spe-

cial track created by *Network World* and begun on Monday continues Tuesday and Wednesday afternoons from 2:00-3:15. End users also will find much of value in other mid-week sessions as they pursue their particular interests.

Wireless followers can take advantage of 9:30-10:45 sessions Tuesday, Wednesday and Thursday mornings that run the gamut of cellular and personal communication services, and that highlight user needs the last morning.

Information services gets under way at 11:00-12:15 Tuesday, Wednesday and Thursday, and everything from retail on-line transactions to fax on demand to interactive and voice-processing options is covered, again with user needs highlighted the last morning.

Video services wraps up the day Tuesday and Wednesday, 3:30-4:45, with discussion of the incredible array of existing and potential customer premises equipment and the developments in dial-up videoconferencing.

The synchronous optical network, signaling system 7 and the 800 database receive thorough coverage beginning with dual sessions on Monday morning—a SONET primer and a SONET deployment discussion. The SS7 primer follows that afternoon. Then, in the same 2:00-3:15 time slot on Tuesday, comes assistance in selecting SS7 methodologies and on Wednesday an overview of 800 number portability from all perspectives.

Fast-packet switching is the subject of an additional primer—this one on Tuesday afternoon and offered in two parts.

HDSL/FITL and all those other acronyms! Yes, we all really do need to know them because they stand for and behind some of the most exciting break-through transmission technologies today. Arrive in time for Monday's final session (3:30-5:15) on high-speed copper transmission. Then set aside the 11:00-12:15 time slot on Tuesday and Wednesday for exploration of fiber in all its dimensions.

Small carriers have special concerns that get special treatment at this conference, including 3:30-4:45 sessions that bring them together on Tuesday for discussion of access restructure and on Wednesday for discussion of infrastructure sharing. They gather again Wednesday 8:00-9:15 for a question and answer session on equal access implementation.

All carriers have concerns about network evolution that can be explored in a Tuesday-Thursday 9:30-10:45 series that covers growth management and the intelligent network and the Advanced Intelligent Network. Also of interest will be the concluding seminar on Thursday morning on network reliability.

And there's much more! Admittedly, the above does not begin to cover all the possibilities for putting together a personal agenda at SUPERCOMM. But please see

continued on page 14

Chicago—A City of Neighborhoods

Chicago, the "heart of the Midwest," is perhaps so called because it gives life to so many neighborhoods, which branch out in all directions and pulsate with interest. The endless opportunities range from cultural institutions, to cuisine from around the world, to places meant for just relaxing and taking in the sights.

McCormick Place, the location for SUPERCOMM and ICC, is a few minutes south of downtown. Between is Grant Park, which offers educational excursions at the Shedd Aquarium, the Field Museum of Natural History and the Planetarium—as well as some of the best lakefront benches on which to enjoy a June afternoon. If you're a real architecture buff, you won't want to miss nearby Printer's Row. This delightful neighborhood of restored buildings houses great bookstores, among other attractions.

Spreading south and west from downtown are the ethnic neighborhoods of Chinatown, Little Italy and Greektown.

The Loop/Downtown/North Michigan Avenue area has everything! Take time out to explore the Art Institute and private galleries, the theaters and the financial district—as well as to do some world-class shopping on the "Magnificent Mile" and at colorful Navy Pier.

Proceeding north to the Gold Coast, Old Town and Lincoln Park, experience the nightlife for which Chicago is so famous. Enjoy laughter at the home of the Second City improvisational group. Take in Rush Street where the sounds of blues and jazz reverberate. In addition to more theaters and art galleries, you'll also find other spots of interest along the side streets of brownstones.

You should know, as well, that Chicago offers spectacular overviews of the city via chartered boat tours. Other specialties include architectural tours and corporate/business tours that include the Chicago Board of Trade and Mercantile Exchange. The organized tours being offered by ICC '92 may be of interest, too.

Where to eat? Everywhere! Try as many neighborhoods and varieties of restaurants as time allows.

How to get around? First, a cab ride from O'Hare Airport is approximately 50 minutes to downtown, or about a $22 fare. However, the share-a-ride program charges a flat rate of $12 and transport via rail is another inexpensive option. A typical cab ride from the downtown area to McCormick Place takes approximately 10 minutes.

There will be complimentary shuttle buses between designated SUPERCOMM and ICC hotel properties and McCormick Place. Check with hotel bellstands for schedule details.

SONET I



LITESPAN®-2000 IS THE WORLD'S FIRST INTEGRATED SONET OPTICAL LOOP CARRIER

If you'd like to expand your capacity, offer advanced services and position your company for Fiber-In-The-Loop capabilities, your time has come.

Available now, Litespan-2000 carries up to 2,016 subscribers over a single pair of optical fibers and provides the capacity for ISDN and other advanced services, including video. It is compatible with different vendor equipment and minimizes the risk of capital obsolescence.

PROTECT YOUR CURRENT INVESTMENT

Litespan-2000 will work with the analog and digital equipment you've already deployed. You can take immediate advantage of its extensive bandwidth without changing the way you operate. In addition, plug-in cards expand channel capacity and your capabilities. So the longer you own it, the greater the return on your investment.

POSITION YOURSELF FOR NEW REVENUE-GENERATING OPPORTUNITIES

Modular architecture enables Litespan-2000 to expand as your needs grow. TR-303 ready, Litespan-2000 is the only platform you need to launch future loop services. Which gives you the flexibility to trial and offer services that maximize your profits. Or reallocate existing customer services with minimal effort. Either way, you'll have the freedom to maximize the efficiency of digital bandwidth and expand your capabilities as customer demands warrant.

S NOW.



THE ONLY INTEGRATED PLATFORM FOR FIBER TO THE CURB

Although much of the telecommunications industry talks about delivering Fiber-In-The-Loop services, only DSC's Litespan-2000 provides the integrated platform to get you there today. Our newest product, Starspan™, will be tangible proof that DSC is prepared to extend your fiber capabilities from the central office to the curb.

PROVIDE GREATER CONTROL AND FLEXIBILITY FROM A SINGLE ACCESS POINT

Only DSC can bring you Litespan-2000. Completely remote-controlled technology so robust it expands capabilities. Optimizes facilities. And provides easy access to cost-effective operations by enabling you to make network modifications — without dispatching to the field. You'll handle provisioning, traffic monitoring, maintenance and bandwidth allocation more efficiently as you meet customer needs.

For more information about Litespan-2000, write DSC Communications Corporation, 1000 Coit Road, Plano, Texas, ⁻50⁻5 or call 1-800-⁻⁻⁻-6804. With it you'll quickly satisfy customer demands in a manageable and cost-efficient manner, and position your company for a graceful migration to the future.

DSC COMMUNICATIONS CORPORATION

continued from page 11

seminar descriptions (with names of expert speakers where known at an early press deadline). You are certain to find compelling reasons to attend and a clear path to accomplishing your own goals while there.

Walking the SUPERCOMM exhibit floor is a unique experience. From the nearest to the farthest wall, from the front to the rear of the hall, the floor is filled with technology and products being used in the finest telecommunications networks in the world today—and with the technology and products that will keep those networks on top tomorrow.

The future of telecommunications stands shoulder to shoulder with the muscle of today's powerful networks on the sprawling SUPERCOMM floor.

In the past, the technology and products on display at SUPERCOMM were targeted almost exclusively for the United States public networks operated by the telephone companies. But the past several years have seen a dramatic change at SUPERCOMM.

It has become an event for the whole industry with telephone company personnel joined on the floor by those who work in new, affiliated and often, competitive fields. Among them all is a great opportunity to see how one person's business interacts with and influences the other's. It also has become a major meeting ground for the global telecommunications industry.

Like the telecommunications industry itself, the SUPERCOMM exposition is changing and growing to embrace corporate telecommunications and MIS managers, private network technology and capability, and the global market.

In an industry without walls, SUPERCOMM brings every sector of the industry and all its technology areas together in one building for four exciting days. There is nothing comparable at any other annual telecommunications industry event anywhere in the world.

When you walk the floor, what kinds of capabilities will be on display?

For switching aficionados, the digital switch manufacturers will show the latest technology wrinkles and high-tech applications they've created in their laboratories. In addition, this year's attendees can look for the latest developments in broadband, packet, asynchronous transfer mode and even photonic switching on the SUPERCOMM floor. These technologies will function as the passing lanes in the superhighways of tomorrow's networks.

And, of course, the latest in PBX technology as well as Centrex functionality will be demonstrated. Data communications, network management, and test and monitoring equipment will be shown throughout the hall.

The transmission area is undergoing the most rapid and consistent technological development of any area in the network. The most recent developments in intelligent network elements, cross-connects, loop carrier and channel banks will be seen in Chicago.

In addition, a wide variety of fiber optic-related technologies and products will be demonstrated. Look for the most recent information on synchronous optical network/synchronous digital hierarchy products, on electronics developed specifically for fiber applications and on fiber-in-the-loop technology.

Expect exhibitors to demonstrate a wide variety of high-capacity services, including video services and integrated services digital network equipment and services. Metropolitan area networks, wide area networks and local area networks will all be abundantly present.

Multiplexers and T-1/T-3 connectivity will be featured prominently on the show floor. And the operations support systems that make all these complex technologies function smoothly will again attract a lot of attention.

A variety of industry-specific services will be demonstrated, including accounting services and systems, data-processing services, billing services, consulting services, engineering services, directory publishing services, research, marketing and mapping services. Training and educational services, which are increasingly important as technology becomes more sophisticated and service providers reduce their forces, will be well represented on the bustling show floor.

A variety of outside plant services and products will be shown. They will include maintenance equipment, construction equipment and supplies, buildings and shelters, cable-splicing materials, splice cases, ladders, alarm reporting systems, pole line equipment, locators, signs and identification equipment, and protection equipment. And, of course, wire and cable will be prominent at SUPERCOMM.

Power and energy technology and products—the backbone of all telecommunications technologies and services—will occupy a considerable amount of the SUPERCOMM floor. Software developers will, too.

The SUPERCOMM exposition is the best annual event in the world to get a handle on the rapidly changing technology and the wide variety of products that, together, make the globe-girdling machine that is the modern telecommunications network ceaselessly hum.

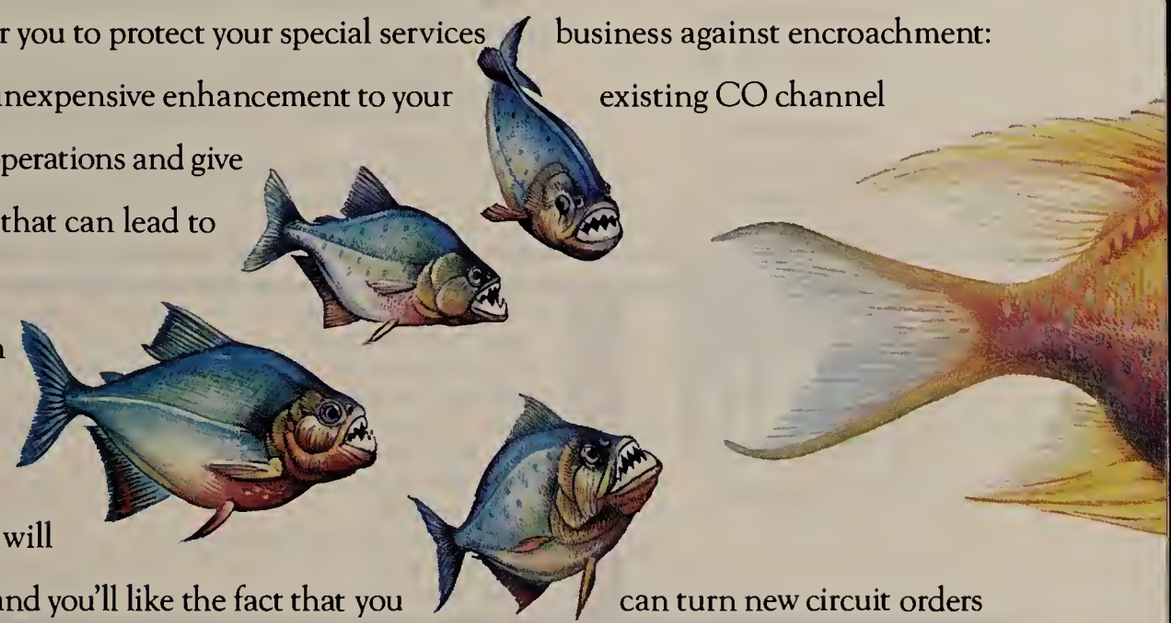
Matching service will schedule meetings

Counterpart Business Matching Service will match and schedule companies for private one-on-one meetings at SUPERCOMM. Participants may choose the companies and the countries for the meetings. Meetings help SUPERCOMM companies expand sales, establish distributorhips or develop joint ventures in the U.S. or internationally. For more information and Counterpart registration forms, please contact Dr. Noreene Janus, Executive Vice President, Counterpart. Phone: (703) 524-8704 or Fax: (703) 524-8705.

WHY TELCOS NEED A FASTER WAY TO ADD SERVICES.

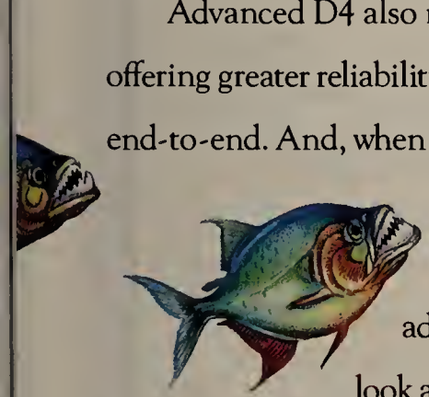
They're gaining on you. A host of alternative carriers with only one thing in mind: having lunch at your expense.

We offer an easy way for you to protect your special services business against encroachment: Advanced D4. It's a simple, inexpensive enhancement to your existing CO channel banks. It can improve your operations and give you a marketing advantage that can lead to increased profits.



Our Advanced D4 can cut your provisioning time for special services by up to three weeks. Your customers will like the faster installations and you'll like the fact that you can turn new circuit orders into new revenues a lot quicker.

Advanced D4 also monitors the performance of your T-1 facilities. So you can promote lines offering greater reliability, guaranteed performance levels, and round-the-clock monitoring from end-to-end. And, when a rare problem does slip through, you'll be able to cut repair time in half.



Faster provisioning. Superior T-1 performance monitoring and integral analog and digital testing. Lower operational costs. An aggressive marketing advantage. All for a minimal investment. No matter how you look at it, Advanced D4 looks good.



Our brochure will show you how to turn the tide on competition. To get your copy, call 1-800-241-EASY. Or write to AD4 Product Marketing, Integrated Network Corporation, 757 Route 202/206, Bridgewater, NJ 08807.

Red piranha
Genus: *Serrasalmus nattereri*
Species: *Characins*

Description: *Any of a series of fierce, predatory fish known for their ability to take a bite out of larger prey.*

See us at ***SUPERCOMM® '92****, booth 1860.*
Advanced D4 • UDVM • Dataports • Sw 56

INTEGRATED NETWORK CORPORATION

WE'LL MAKE IT EASY.

PROGRAM AT A GLANCE

Monday

No Exhibits

8:00 – 9:00 a.m.
International Panel by ICC '92

Level 100

SUPERCOMM Sessions For Everyone FREE!

Choose from more than 40 SUPERCOMM '92 non-technical seminars

9:30 - 10:45 a.m.
101 Synchronous Optical Networks–An Update
102 Developing European Digital Cellular Market
103 Evolving Information Environment–User Needs
11:00 a.m. - 12:15 p.m.
104 Applications and Implementations of SONET
105 Report Card on Investments in International Telecommunications
106 User Benefits/New Public Network Architectures
2:00 - 3:15 p.m.
107 The Basics of CCS/SS7
108 Opportunities in the Asia/Pacific Telecommunications Market
109 User Management of New Public Network Services
3:30 - 4:45 p.m.
110 Harmonious Hybrids in the '90s
111 The Caribbean–Telecom Growth Market
3:30 - 5:15 p.m.
112 HDSL: COPPER Value Just Went Up!

Level 200

For Everyone
(Fee)

Grouped in three technical levels, the following are offered by ICC '92

9:30 a.m. - 12:15 p.m.
201 ISDN Services
202 FTTH–Network Migration Strategies
11:00 a.m. - 12:15 p.m.
203 Quality Issues in Network Operations and Management
2:00 - 3:15 p.m.
204 Key Issues for FITL Systems
3:30 - 4:45 p.m.
205 Near-Term IN Services
2:00 - 4:45 p.m.
206 ISDN Update

Level 300

ICC Sessions
(Fee)

9:00 a.m. - noon
301 Performance Analysis of Data Communication Protocols
302 Topics in Wireless Communications
303 Voice Technology Advances–Public/Private
304 Combining Radio and Fiber
305 Signal Processing for Digital Storage Systems
306 Packet Switching
307 Self-Healing Networks and Integrated Network Management
308 Management of High-Speed LAN/WAN Interconnect Networks
309 Personalized TV
310 CDMA for Personal & Mobile Communications (half session)
2:00 - 5:00 p.m.
311 ATM Switching and Broadband Networking
312 Digital Cellular and Microcellular Systems
313 Application of Signal Processing in Coding
314 Communications Satellite Technologies
315 Queueing Performance of Data Networks
316 Network Survivability Performance
317 Specification Description Technologies for Communications Software
318 Quality Management for Customer Satisfaction
319 Radio Design Techniques and Algorithms for Personal Communications
320A Queueing Models for Data Communication Networks
320B Advances in Video and Image Compression Techniques

Level 400

ICC Tutorials and Workshops*
(Fee)

9:00 a.m. - 5:00 p.m.
401 *Tutorial #1* Broadband Networking
9:00 a.m. - noon
404 *Tutorial #5* Telecommunications Management Network: Principles, Models & Applications
2:00 - 5:00 p.m.
405 *Tutorial #6* Signaling System No. 7 for Fixed and Mobile Networks

12:15 - 1:45 p.m.
ICC Awards Luncheon

***For technically-oriented professionals seeking an overview. Register early—space is limited**

Tuesday

Exhibit Hours
9 a.m.-5 p.m.

PROGRAM AT A GLANCE

8:00 – 9:00 a.m.
Joint Plenary Session/Keynote Address

9:30 - 10:45 a.m.
113 Numbering Resources: Will We Run Out?
114 Where Will PCS & Cellular Meet in the Market?
115 Managing Growth in Evolving Public Network
11:00 a.m. - 12:15 p.m.
116 Exploring Transition to Competition
117 Information Services: Retail On-Line Transaction Processing
118 Money Matters: Fiber in the Loop–Part I
2:00 - 3:15 p.m.
119 Planning Considerations for CCS/SS7
120 Introduction to Fast-Packet Switching–Part I
121 New for '92: User Applications of ISDN
3:30 - 4:45 p.m.
122 Access Restructure–What's at Stake for Small Companies?
123 Video Customer Premises Equipment
124 Introduction to Fast-Packet Switching–Part II

Level 100
SUPERCOMM Sessions For Everyone

9:30 - 10:45 a.m.
207 Network Update: The Digital Transition
208 Technology Management
11:00 a.m. - 12:15 p.m.
209 SONET–Impact on the Network
210 Radio Access
2:00 - 3:15 p.m.
211 New Network Applications
212 PCS Networking Evolution
3:30 - 4:45 p.m.
213 Private Digital Radio Networks
214 Advances in DLC Systems

Level 200
For Everyone

9:00 a.m. - noon
321 Emerging IN: Transition & Implementation Issues
322 Impact of Multimedia Services on Protocols
323 Modulation and Coding I
324 Performance Enhancement Techniques in PCS Radio
325 Dimensioning/Control of ATM Networks I
326 High-Speed Optical Transmission Technology
327 Global Information Networking
328 Land Mobile Satellite Communication Techniques
329 Adaptive Filtering in Pulse Shaping & ISDN
2:00 - 5:00 p.m.
330 Photonic Switching and Interconnects
331 PCN Radio Systems Engineering
332 Progress in Broadband Switching Systems
333 Modulation and Coding II
334 High-Speed Protocols
335A Dimensioning/Control of ATM Networks II
335B Network Control and Service Management in ATM Networks
336 Issues in Wireless Communication Networks
337A Propagation Effects in Satellite Communications
337B Multimedia Communications for Cooperative Applications
338 High-Speed MANs
339 Customer Evaluations

Level 300
ICC Sessions

9:00 a.m. - 5:00 p.m.
402 *Tutorial #2* Broadband Services and Industrial Applications
9:00 a.m. - 12:30 p.m.
407 *Workshop #1* Network Synchronization
2:00 - 5:00 p.m.
408 *Workshop #2* Technology Management: A Shifting Paradigm

Level 400
ICC Tutorials and Workshops*

6:00 p.m.
ICC Conference Reception and Banquet

Grouped in three technical levels, the following are offered by ICC '92

PROGRAM AT A GLANCE

Wednesday

Exhibit Hours 9 a.m.- 5 p.m.

8:00 – 9:15 a.m.
General Session

Level 100

SUPERCOMM Sessions For Everyone

9:30 - 10:45 a.m.
- **125** The Basics of IN/AIN
- **126** The Ameritech PCS Trial
- **127** Distance Learning: Minds Across Miles

11:00 a.m. - 12:15 p.m.
- **128** Accelerated Modernization of Infrastructure and Economic Benefits
- **129** Delivering Enhanced Services to the Customer
- **130** Looking Ahead: Fiber in the Loop–Part II

2:00 - 3:15 p.m.
- **131** 800 Number Portability
- **132** National Network Billing Services
- **133** New International Services for Corporate Users

3:30 - 4:45 p.m.
- **134** Infrastructure Sharing–Services for Small Companies
- **135** Dial-up Videoconferencing/When a Reality?

3:30 - 5:15 p.m.
- **136** Automatic Message Accounting Modernization

Grouped in three technical levels, the following are offered by ICC '92

Level 200

For Everyone

9:30 - 10:45 a.m.
- **215** Expert Systems in Telecommunications: Real-World Experiences

9:30 a.m. - 12:15 p.m.
- **216** Significant Telecom Technology Standards

11:00 a.m. - 12:15 p.m.
- **217** Broadband ATM/STM Network Services Opportunities

2:00 - 3:15 p.m.
- **218** Architectural Considerations for Enhanced Services Platforms
- **219** Broadband Networks and Systems: Experiments and Trials

3:30 - 4:45 p.m.
- **220** Capturing Cellular Mobile Data Markets
- **221** Mass Market Telecom Services

Level 300

ICC Sessions

9:30 a.m. - 12:30 p.m.
- **340** Photonic Networks I
- **341** Congestion Control & Routing in High-Speed Networks
- **342** Wireless Local Area Networks
- **343** Neural Network Techniques: Adaptive Filtering
- **344** Analysis & Design: Communications Systems
- **345A** Mobile Communication Networks
- **345B** Packet Radio Networks
- **346** Coding for Digital Storage Systems
- **347** Advanced Technologies in Management of Transport Networks
- **348** Advances in Data Communications

2:00 - 5:00 p.m.
- **349** Photonic Networks II
- **350** Advanced Techniques for Terrestrial Digital Radio
- **351** Adaptive Equalization of Time Dispersive Channels
- **352** AI Applications in Telecommunications
- **353** Digital Signal Processing for Satellite and Space Communications
- **354** Advances in ATM Switching
- **355** Global Quest for Quality Products and Services
- **356** PCSs and Their Implementation

Level 400

ICC Tutorials and Workshops*

9:30 a.m. - 5:00 p.m.
- **403** *Tutorial #3* Spread Spectrum Systems: Techniques and Applications
- **406** *Tutorial #4* Satellite ISDN: Architectures, Technology and Applications

***For technically-oriented professionals seeking an overview. Register early—space is limited**

Thursday

Exhibit Hours 9 a.m.- 3 p.m.

PROGRAM AT A GLANCE

8:00 – 9:15 a.m.

137 Q&A for Small Telcos on Implementing Equal Access

9:30 - 10:45 a.m.

138 Perspectives on Advanced Intelligent Network

139 Wireless Data Communications–Taking Users Into the Future

140 Competitive Alternatives to the Local Loop

11:00 a.m. - 12:15 p.m.

141 Where the Rubber Meets the Road: Successful National ISDN Deployment

142 A User's View of Voice Processing Today

143 Preventing Network Outages

Please Note: Schedule Subject to Change

Level 100

SUPERCOMM Sessions For Everyone

About these events...

There is no charge for the general programs that start the day at 8:00 a.m. Monday-Wednesday, or for the SUPERCOMM 100 Level seminars. Also, please note that among these non-technical seminars are four designated as primers (101, 107, 120 and 124).

ICC's 200 Level sessions, while somewhat technical, are specifically designed to be applications-oriented and of interest to SUPERCOMM attendees. And while 300 Level sessions become more technical yet, two of them have been set aside for general interest (318 and 327); there is no charge for either of these. Otherwise, moderate fees apply to the 200 and 300 Level sessions, the 400 Level tutorials and workshops, and the ICC Awards Luncheon and Conference Banquet. See fee schedule on the registration form.

And of particular interest to end users...

Please note the complementary seminars that have been specifically designed with telecom/MIS managers in mind (103, 106, 109, 110, 117, 121, 123, 129, 133, 135, 139, 142).

Another option is the Gigabit Networking Workshop, Tuesday-Wednesday, 8:30 a.m. - 2:00 p.m. For more information on this new forum for senior level administrators of private networks, see page 45. There is a fee for this; see the registration form, line I.

Help Us Help You

We want to make your comfort our priority. But we need your help. Please write in the SUPERCOMM '92 and ICC '92 session numbers or other events you plan to attend, so we can make the best use of the available meeting space. Return to Henry Wieland, Executive Director-Special Events, USTA, 900 19th Street, NW, Suite 800, Washington, D.C. USA 20006-2190. Fax: (202) 835-3248. Thank you!

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SUPERCOMM/ICC '92 Highlights

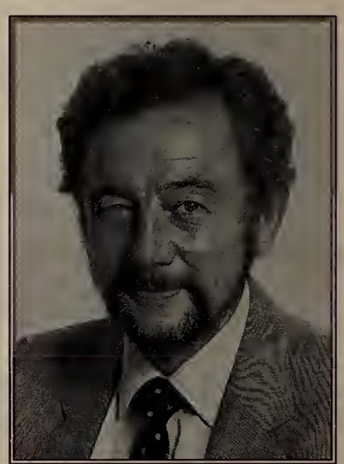
8:00 AM - 9:00 AM

Monday ICC Plenary Session

Northern Telecom's Vice President of Technology Planning, Frank Splitt, chairs a panel discussing the changing world of international telecommunications. He describes the session as one that will provide attendees with valuable insights into world trade, as well as the impact of the European Economic Community. CCITT's Director, Theo Irmer, will share his perspectives on international telecommunications standards and Telefonica International's Chairman, Enrique Used Aznar, will outline the progress made in modernizing Spain's telecommunications network.



Frank Splitt

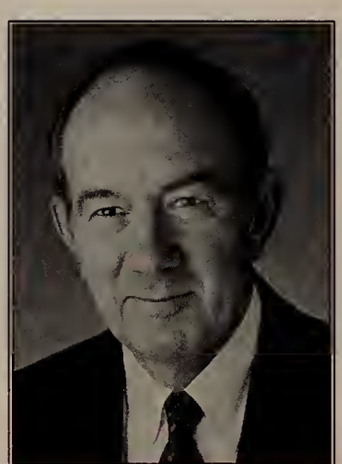


Theo Irmer



Enrique Used Aznar

Irmer, after completing studies in telecommunication technologies at the Technical University of Karlsruhe (Germany), worked in the Telecommunications Engineering Centre of the Deutsche Bundespost (German PTT). He has been an active participant in the international field of CCITT Study Groups since 1968. CCITT is one of the permanent organs of the ITU in Geneva. Used, in addition to his chairman's role, is General Manager of International and Advanced Services. His experience ranges from various posts where he was one of the forerunners in the development of early satellite activities, managed frequencies for the microwave and satellite systems within Telefonica, and oversaw its development of several systems, the most important being the multi-access rural system and the TESYS equipment.



William Weiss

Noon - 1:30 PM

Monday ICC '92 Luncheon

The Awards Luncheon will feature William L. Weiss, Chairman and Chief Executive Officer of Ameritech. Weiss will speak on a theme of knowledge is power, and will provide ideas of what technologies and policies are needed for an Information Society. Weiss began his career in 1951 when he joined Bell of Pennsylvania. In 1976, he was named President of Operations for Wisconsin Telephone (now Wisconsin Bell), by 1978 was President of Indiana Bell, and by 1981, was named President and Chief Executive Officer of Illinois Bell until Ameritech began its operations on Jan. 1, 1984. ICC '92 fee applies.

8:00 AM - 9:00 AM

Tuesday Joint Plenary Session

"Learning to Compete in a Market-Driven Wireless World" will be the subject of Motorola Chairman George Fisher's remarks. As keynote speaker he will discuss the driving force behind Motorola's success and tell us what we need to know about wireless communications and how it's going to affect us. The field continues to grow in importance as we move into an Information Society where mobile transmission of data to network-based computers is expected to multiply many times over. Fisher has been with Motorola since 1976, after spending 10 years in research and development with Bell Telephone Laboratories. He is Chairman of the U.S. Council on Competitiveness and is active in U.S./international trade issues through advisory groups to the U.S. Trade Representative and Secretary of Commerce. In 1988, Electronic Business Magazine selected Fisher as one of the 12 most admired executives in the electronics industry. He also received the Telocator Engineering Achievement Award and was cited as one of Business Week's Managers of the Year for 1989. Exhibits open at 9:00 a.m. immediately following his address.



George Fisher

7:00 PM-10:00 PM

Tuesday ICC '92 Banquet

George H. Heilmeier, the new President and Chief Executive Officer of Bell Communications Research, will address this annual banquet. After spending more than 13 years with Texas Instruments, Heilmeier was elected to his position at Bellcore effective March 1, 1991. Recently, he was honored by President Bush with the National Medal of Science for his contributions to the technological competitiveness of the U.S. and to the cause of national defense. Bellcore is the research and engineering consortium that supports the seven Bell regional telecommunications companies, Southern New England Telephone and Cincinnati Bell. ICC '92 fee applies.



George Heilmeier

8:00 AM - 9:15 AM

Wednesday General Session



Denis Philip Doyle

The General Session will highlight the role of telecommunications in education and complement the Super-School display. Watch for more details in future promotions. But for now, note that there will be a panel discussion led by Denis Philip Doyle, Senior Fellow at the Hudson Institute and an education consultant, speaker and author. Among his books is "Winning the Brain Race: A Bold Plan to Make Our Schools Competitive" co-authored with U.S. Deputy Secretary of Education David Kearns. The panel will address the forces behind the restructuring movement in education, with the aim of identifying "technology fit"...what technology offers education and what opportunities this market offers the telecommunications industry.

SUPERCOMM '92 Seminars

MONDAY, JUNE 15

No Exhibits

9:30 AM - 10:45 AM

101. (Primer) Synchronous Optical Networks (SONET)—An Update

SONET was proposed as a universal fiber optic transmission interface standard in 1985. Refinements and enhancements have been developed. This primer describes the evolutionary path of SONET and projects future developments.

Introduction: *Dennis Byrne, Executive Director-Operations and Engineering, U.S. Telephone Association*

Speaker: *Yau-Chau Ching, Director-SONET Project Management, Bellcore*

9:30 AM - 10:45 AM

102. The Developing European Digital Cellular Market

Europe is on its way toward covering the continent with a digital cellular (GSM) network. Learn where the European Community is going.

Moderator: *Christina Callmer, Manager-Markets Development, Ericsson*

Panelists: *TBA*

9:30 AM - 10:45 AM

103. The Evolving Information Environment: User Needs and Concerns

Telecom managers discuss their voice and data needs in a world of mixed media information processing and transmission. New and faster communications are considered, as well as who should provide and control services.

Moderator: *Alan Stewart, Technical Editor,* Communications News

Panelists: *Pat Krause, Director-Telecommunications, McDonald's Corp.; others TBA*

11:00 AM - 12:15 PM

104. Applications and Implementations of SONET

SONET has excellent potential as a versatile transport approach for a wide range of future services and network topologies. Panelists discuss applications, current equipment, and implementation strategies.

Moderator: *Dr. Neven Karlovac, Executive Vice President-Technical Operations, Alcatel Network Systems Inc.*

Panelists: *Hagen Hottmann, Member Technical Staff, Bellcore; Steve Hratko, Marketing Manager-Networking, DSC Communications Corp.; Mark T. Willborn, Technical Marketing Specialist, Alcatel Network Systems Inc.*

11:00 AM - 12:15 PM

105. A Report Card on Investments in International Telecommunications

An update and analysis of U.S. investments in the European Community (EC), Eastern Europe, South America and the Far East. Good background for afternoon international sessions.

Moderator: *Lawrence Kenny, International Partner, Coopers & Lybrand*

Panelists: *Tim Nulty, Senior Economist, World Bank; Rand Rosenberg, Director, Salomon Brothers Inc.; W. Gras, Vice President and Chief Financial Officer, U S WEST International and Business Development Group*

11:00 AM - 12:15 PM

106. User Benefits of New Public Network Architectures

Explore the implications and benefits of public network architectures—specifically Bellcore's Advanced Intelligent Network initiative—for corporate users.

Moderator: *Anita Taff, Washington Bureau Chief,* Network World

Panelists: *Steve Parrish, Senior Director of Product Development, Ameritech; others TBA*

2:00 PM - 3:15 PM

107. (Primer) The Basics of CCS/SS7

Many LECs are planning to offer advanced services through deployment of Common Channel Signaling networks using Signaling System 7 protocol. This primer covers basic network architecture and protocols.

Introduction: *Gerald R. Stearns, Director-Network Planning and Design, U.S. Telephone Association*

Speaker: *Walt Roehr, Executive Director, Telecommunication Network Consulting*

Monday, June 15

2:00 PM - 3:15 PM

108. Opportunities in the Asia/Pacific Telecommunications Market

Impressive changes are occurring in Asia/Pacific market opportunities. An involved panel identifies the changes and discusses current supplier opportunities.

Moderator: *Jim Savage, Assistant Director, Pacific Telecommunications Council*

Panelists: *James Cullen, Vice President and General Manager, CANAC Telecom; Tedson Meyers, Partner, Reid & Priest; Francis Urbany, Director-International and Agency Relations, BellSouth*

2:00 PM - 3:15 PM

109. User Management of New Public Network Services

Managing telecommunications services is critical to the success of corporations. Learn how corporate users can increase the public network's value to better fulfill their needs.

Moderator: *Representative from* Telephony

Panelists: *Rick Moran, Operations Manager-Customer Network Management, BellSouth; others TBA*

3:30 PM - 4:45 PM

110. Harmonious Hybrids in the '90s

Can private and public networks function in harmony? Users and vendors discuss strategies that work toward extending the reach of private networks while tapping public network functionality.

Moderator: *Terry Sweeney, Public Networking Editor,* Communications Week

Panelists: *Steve Barnhart, Vice President-Sales & Marketing, Applied Computing Devices Inc.; Joseph Baylock, Program Director-Enterprise Network Strategies, The Gartner Group Inc.; Jim Michaels, Vice President-Strategic Networks, Newbridge Networks Inc.*

3:30 PM - 4:45 PM

111. The Caribbean—Growth Market for Telecommunications

Telecommunications will play an important role in the growing Caribbean, Central and South American economies. Learn how to enter and participate in these opportunities.

Moderator: *Phoebe F. Isales, Esq., Executive Director, Caribbean Telecommunications Council*

Panelists: *Hon. Antonio J. Colorado, Secretary of State of Puerto Rico and Resident Commissioner Designate; Milton Ganley, President, Caribbean Telecommunications Council; Cornelius B. Prior, Chairman of the Board, Virgin Islands Telephone Corp.; Luis G. Romero-Font, President, Codecom Inc.; Hon. Eduardo Vallarino, Ex Panamanian Ambassador to the United States*

3:30 PM - 5:15 PM

112. HDSL: The Value of Copper Just Went Up!

A high-speed copper transmission technology has arrived on the telecom scene: HDSL (High-bit-rate Digital Subscriber Line). Providers and vendors discuss this breakthrough in deployment for T-1 and Fractional T-1 services. Asymmetric Digital Subscriber Line also will be discussed.

Moderator: *William R. Murphy, Senior Product Planner-Network Products Division, Tellabs Inc.*

Panelists: *Mark Balmes, Operations Manager-Transport Product Evaluation, BellSouth Telecommunications; Howard Flagg, President and CEO, PairGain Technologies; Ray Kostalek, Manager-Loop Transport Systems, Ameritech Services; Dave Little, Senior Engineer-Technology Deployment-Transport, Bell Atlantic Network Services; Dave Waring, Director-High Bit Rate Loop Transmission, Bellcore*

Tuesday, June 16

Exhibits 9:00 AM - 5:00 PM

8:00 AM - 9:00 AM

Joint Plenary Session—George Fisher, Chairman, Motorola

9:30 AM - 10:45 AM

113. Numbering Resources: Will We Run Out?

As the basis for telecommunications, the availability of numbering services must be ensured by thoughtful planning. A look at issues threatening to exhaust numbering resources and measures guaranteeing them.

Introduction: *Dennis Byrne, Executive Director-Operations and Engineering, U.S. Telephone Association*

Speaker: *Fred Gaechter, Member Technical Staff, North American Numbering Plan Administration, Bellcore*

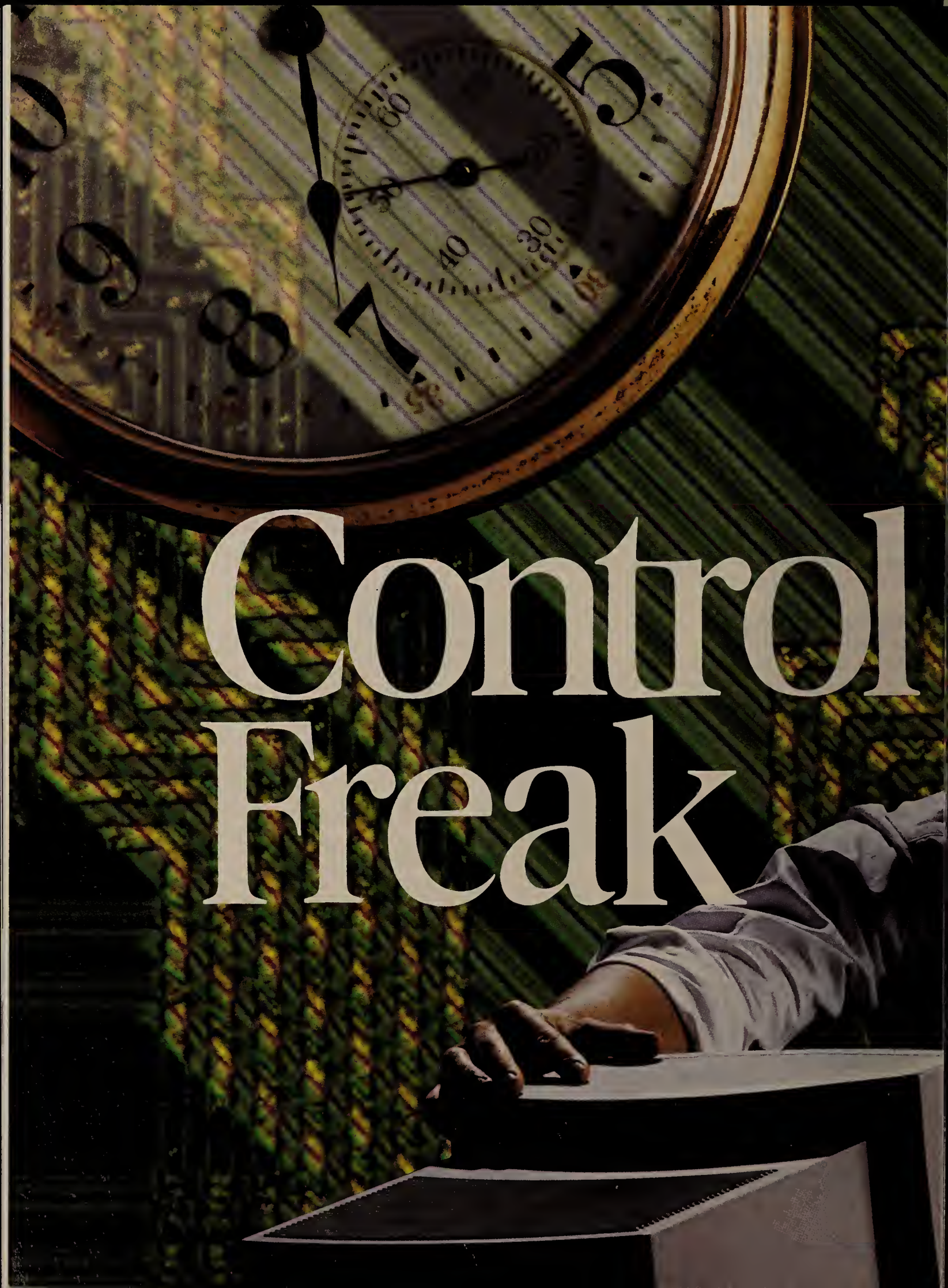
9:30 AM - 10:45 AM

114. Where Will PCS and Cellular Meet in the Marketplace?

Join this panel to explore how the wireless world of PCS/digital cellular will unfold and the roles each will play in serving residential and commercial customers.

Moderator: *Rhonda Wickham, Editor,* Cellular Business

Panelists: *Representative of Cellular Telecommunications Industry Association; John DeFeo, President & CEO, U S WEST NewVector; Barry E. Goodstadt, Principal-Telecom Group, Arthur D. Little Inc.; Thomas Stroup, President, Telocator*


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TUESDAY, JUNE 16

9:30 AM - 10:45 AM

115. Managing Growth in the Evolving Public Network

Network evolution is requiring telcos to rapidly add network features. Small companies often do not have the expertise to handle these deployments; large companies are experiencing work-force cutbacks and regulatory pressure. The panel considers operational support in this environment.

Moderator: *TBA*

Panelists: *TBA*

11:00 AM - 12:15 PM

116. Exploring Transition to Competition

A look at all major aspects of competition's impact on the industry. How today's policies are creating new opportunities (and risks) in a changing environment.

Moderator: *Andrew Barrett, Commissioner, Federal Communications Commission*

Panelists: *Dick Brown, President, Illinois Bell; Donald McClellan, Esq., Legislative Assistant, U.S. Sen. Conrad Burns; Thomas McKell, President, Chillicothe Telephone Co.*

11:00 AM - 12:15 PM

117. Information Services: Retail On-Line Transaction Processing and the LEC Approach to Improve Local Access

LECs discuss their approach to improve performance and the cost of local access to retail on-line transaction processing networks, and why the phone company is still the best solution.

Moderator: *Jonathon Rick, Partner, POS Network Consulting*

Panelists: *Michael Duckett, Director-Technical Support, BellSouth; Gaffney Gunter, Senior Manager-Application Products, Northern Telecom; Michael Sapien, Director-Point of Sale/Packet Switching, Pacific Bell*

11:00 AM - 12:15 PM

118. Money Matters: Fiber in the Loop—Part I

The economics of fiber deployment are explored based on extensive field trial experiences and anticipated developments in products and costs.

Moderator: *Richard K. Snelling, Executive Vice President-Network (Retired), Southern Bell*

Panelists: *Mike Barrett, Project Manager, Siecor Corp.; John S. McConnell III, Director-Product Line Management, BroadBand Technologies Inc.; Ben Wagner, Product Line Manager/FITL, Siemens Stromberg-Carlson*

2:00 PM - 3:15 PM

119. Planning Considerations for CCS/SS7

Most new services under development are based on CCS/SS7 technology, so LEC understanding of various methods of implementing CCS is vital for financial growth. This session assists LECs in determining which equipment is appropriate for their company.

Introduction: *Gerald R. Stearns, Director-Network Planning and Design, U.S. Telephone Association*

Speaker: *Charlene Meins, Member Technical Staff, U S WEST Communications*

2:00 PM - 3:15 PM

120. (Primer) An Introduction to the World of Fast-Packet Switching-Part I

An instructional overview of fast packet, frame-relay, cell-relay, ATM, and SMDS—complementary or competitive? Applications? Who needs it?

Moderator: *Robert Stoffels, Editor,* Telephone Engineer & Management

Panelists: *Don Dineen, Manager-Training & Education, Bellcore TEC; Stephen Fleming, Director-Strategic Marketing, Northern Telecom Inc.; Alan Stewart, Telecommunications Consultant/Journalist*

2:00 PM - 3:15 PM

121. New for '92: User Applications of ISDN

Pronounced dead in 1989, ISDN is poised for a strong comeback in 1992. Users' interest in ISDN capability and the belated development of standards among providers is fueling this market renewal.

Moderator: *Anita Taff, Washington Bureau Chief,* Network World

Panelists: *Gary Jones, JC Penney; Bob Beeman, Project Manager, U S WEST; others TBA*

3:30 PM - 4:45 PM

122. Access Restructure—What's at Stake for Small Companies?

Interstate access is increasingly subject to competition. Learn about the developing consensus among regulators and carriers to restructure the rules for this key LEC revenue source.

Moderator: *Michael Lamb, Vice President-Corporate Support, Sugarland Telephone Co.*

Panelists: *James Lowell, Assistant to the President, Cincinnati Bell Telephone Co.*

TUESDAY, JUNE 16

3:30 PM - 4:45 PM

123. Video Customer Premises Equipment

Video phones, multi-media, workstations, interactive CDs, personal computer windows: Consumer and computer industries on a collision course? How will video CPE emerge?

Moderator: *George Newman, Director-Services Research, IDC*

Panelists: *Dwight Allen, Senior Manager, Director-Telecom Industry Services, Deloitte & Touche; Dr. Richard Baker, Director-Research, PictureTel Corp.; Richard Solomon, Professor, Massachusetts Institute of Technology*

3:30 PM - 4:45 PM

124. An Introduction to the World of Fast-Packet Switching—Part II

Continuation of session 120 on frame-relay, cell-relay, ATM, and SMDS.

Moderator: *Robert Stoffels, Editor,* Telephone Engineer & Management

Panelists: *Don Dineen, Manager-Training & Education, Bellcore TEC; Stephen Fleming, Director-Strategic Marketing, Northern Telecom Inc.; Alan Stewart, Telecommunications Consultant/Journalist*

WEDNESDAY, JUNE 17

Exhibits 9:00 AM - 5:00 PM

8:00 AM - 9:15 AM

General Session

9:30 AM - 10:45 AM

125. The Basics of IN/AIN

The deployment of advanced intelligent network capabilities provides for faster and better controlled introduction of new services provided by local exchange carriers. This panel explores the basic aspects of IN/AIN.

Moderator: *TBA*

Panelists: *TBA*

WEDNESDAY, JUNE 17

9:30 AM - 10:45 AM

126. The Ameritech PCS Trial

Ameritech plans to have a PCS trial "up and running" in Chicago by SUPERCOMM time. They report on planning, implementation, and trial observations.

Moderator: *Dave Connolly, PCS Program Director, Ameritech*

Panelists: *Mark Beckner, Senior Director-Network Applications Platforms, Ameritech Services; Gary Mittleman, PCS Program Marketing Manager, Ameritech; Morris Westerhold, PCS Program Technical Manager, Ameritech*

9:30 AM - 10:45 AM

127. Distance Learning: Linking Minds Across the Miles

The telecommunications industry has a vital role to play in the education arena—join educators and telecommunications providers to discuss cutting-edge technologies serving students and teachers.

Moderator: *TBA*

Panelists: *Gerald J. Butters, Executive Vice President-Public Networks-Sales and Marketing, Northern Telecom Inc.; Tara D. Knott, Ph.D., President, Evaluation Resources Inc.; Gerry F. Reedy, Education Marketing Manager, Ameritech Services; James Woodward, Chancellor, University of North Carolina at Charlotte*

11:00 AM - 12:15 PM

128. Accelerated Modernization of Infrastructure and Economic Benefits

Panel discusses the need for advanced telecom infrastructure to reach full economic potential, citing examples of government/industry cooperation to promote economic growth.

Moderator: *David Markey, Vice President Federal and Regulatory Affairs, BellSouth Telecommunications*

Panelists: *Hon. Stephen O. Hewlett, Commissioner, Tennessee Public Service Commission; Alfred Koeppe, Vice President-Public Affairs, New Jersey Bell; Madalyn Kuchera, Legal Assistant, FCC Commissioner Andrew Barrett; Charles Oliver, Senior Policy Advisor to the Assistant Secretary, National Telecommunications Information Administration*

11:00 AM - 12:15

129. Delivering Enhanced Services to the Customer

Industry experts outline ways to tap the new voice and data services market including electronic mail, fax on demand, database access, and interactive voice response.

Moderator: *Fred Knight, Editor,* Business Communications Review

Panelists: *John Benedict, Director-Information Services, BellSouth Telecommunications; Stan Little, VIS Systems and Architecture Senior Product Manager, Octel Communications; Don VanDoren, Principal, Vanguard Communications*

11:00 AM - 12:15 PM

130. Looking Ahead: Fiber in the Loop—Part II

Future services and Next Generation Digital Loop Carrier (NGDLCs) systems—learn how they will favorably impact deployment of fiber in the loop.

Moderator: *Clifford B. Holliday, Assistant Vice President-Operations & Technology Development, Telephone Operations, GTE Corp.*

Panelists: *Bill Counts, Marketing Manager, Reliance Comm/Tec; Jeff Lanctot, Marketing Manager, DSC Communications Corp.; Dick Sposito, Marketing Manager, Alcatel Network Systems*

2:00 PM - 3:15 PM

131. 800 Number Portability

The FCC recently issued an order on Docket 86-10 to accelerate the portability of 800 numbers. This session covers the attributes of 800 Data Base Service with an overview of an 800 data base arrangement, the service provider's perspective, and the customer's perspective.

Moderator: *Donald G. Bender, Director-National Services Planning, U.S. Telephone Association*

Panelists: *Therese Fauerbach, Director, MCI; Kelly J. Gaylord, Director, Bellcore; Sue Platner, Director, Ameritech Services*

2:00 PM - 3:15 PM

132. National Network Billing Services

Billing experts discuss issues surrounding capture and exchange of information for billing intelligent network services using the CCS/SS7 network. This includes discussion of the billing strategies and their impact on the network elements for Advanced Intelligent Network (AIN) and Switched Multimegabit Data Service (SMDS), as well as CCS.

Moderator: *Mary Walsh, Director-New Services Billing, Bellcore*

Panelists: *Mark Hernandez, Manager-New Services Billing, Bellcore; Dave LeDuc, Technical Director-Billing Services Group, Pacific Bell; Steve Oswald, Director-Billing Architecture and Planning, Bellcore*

2:00 PM - 3:15 PM

133. Going Global: New International Services for Corporate Users

Telecommunications is growing more important to international businesses. This panel reviews the new generation of international services available to users.

Moderator: *Representative from* Telephony

Panelists: *Andrew Burroughs, Vice President-Global Marketing, Sprint International; others TBA*

3:30 PM - 4:45 PM

134. Infrastructure Sharing—Services for Small Companies

Learn why enactment of USTA's proposal for sharing of infrastructure among LECs will be necessary for small companies to provide customers with advanced national services.

Moderator: *Bob Nachtweh, Vice President-Small Company Affairs, U.S. Telephone Association*

Panelists: *Bob Boaldin, President, Elkhart Telephone Co.; others TBA*

3:30 PM - 4:45 PM

135. Dial-up Videoconferencing—When Will It Be a Reality?

Recent developments in technology, standards and tariffs promise to make universal dial-up videoconferencing a reality. Carrier and product providers offer a status report.

Moderator: *Tony Jatcko, Vice President & General Manager, Sprint Video Group*

Panelists: *TBA*

3:30 PM - 5:15 PM

136. Automatic Message Accounting (AMA) Modernization

To support rapid new service introduction, LECs and ICs require a modern billing system to accommodate new services in three hours.

Speaker: *Jack J. Van Ryn, Senior Designer, Bell Canada*

In addition, a panel will address an alternative billing media arrangement for customers who desire electronic access to their billing data.

Moderator: *Richard Zuber, Information Services Director-CORE, Rochester Telephone Corp.*

Panelists: *Catherine Ammann, Executive Director, Pacific Bell; Bonnie Miller, Staff Director, TRG NYNEX; Pam Millikan, Manager Information Systems Billing, BellSouth Telecommunications*

THURSDAY, JUNE 18

Exhibits 9:00 AM - 3:00 PM

8:00 AM - 9:15 AM

137. Q & A for Small Telcos on Implementing Equal Access

Many small companies only now are converting to equal access. This Q & A roundtable session provides answers and advice to attendees faced with implementing equal access. The panel consists of small companies recently converted to equal access.

Moderator: *Dennis Byrne, Executive Director-Operations and Engineering, U.S. Telephone Association*

Panelists: *Mark Stilson, Special Projects Administrator, American Communications Consultants Inc.; others TBA*

9:30 AM - 10:45 AM

138. Perspectives on Advanced Intelligent Network

The FCC began an inquiry into AIN deployment in the context of the open network architecture proceeding, tentatively including all Tier 1 companies. This panel examines the regulatory environment for AIN from domestic and international perspectives.

Moderator: *TBA*

Panelists: *TBA*

9:30 AM - 10:45 AM

139. Wireless Data Communications—Taking Users Into the Future

Users see a great need for wireless data communications—hear what is available today and what you can and cannot expect in the future.

Moderator: *Bruce Frankel, Senior Product Planner, TeleSciences CO Systems*

Panelists: *George Dennis, Manager-Corporate Communications, RAM Mobile Data; Mil Ovan, Marketing Manager-Altair Product Line, Motorola Altair Product Operation; Greg Pearson, Senior Vice President-Technical Management, Microcom*

9:30 AM - 10:45 AM

140. Competitive Alternatives to the Local Loop

Alternative local loop access is a reality. Experts identify those vehicles being used by traditional and alternative carriers to access local area users.

Moderator: *Dr. Joseph S. Kraemer, Industry National Director-Telecommunications, Deloitte & Touche*

Panelists: *Royce J. Holland, President and CEO, Metropolitan Fiber Systems Inc.; others TBA*

11:00 AM - 12:15 PM

141. Where the Rubber Meets the Road: Successful National ISDN Deployment

A look at the operational and marketing potholes the industry must resolve to pave the way for widespread deployment of services based on National ISDN.

Moderator: *Gary Handler, Vice President-Network Technology, Bellcore*

Panelists: *Joe Colson, Switching Systems Vice President-United States Division, AT&T Network Systems; John Seazholtz, Vice President-Technology and Information Services, Bell Atlantic*

11:00 AM - 12:15 PM

142. Solving the Voice-Processing Puzzle — A Solution for Today's Telecom Professional

With broad choices available for enhanced voice services, how do you sort out the features to best serve your needs? Telecom directors provide their perspective on the features to look for with ideas for future voice-messaging requirements.

Moderator: *David Olsson, Senior Vice President, Boston Technology*

Panelists: *TBA*

11:00 AM - 12:15 PM

143. Preventing Network Outages

Recent experience with network interruptions and regulatory reactions requires that communications service providers use every possible resource to ensure network reliability and to develop new methods of recovery.

Moderator: *TBA*

Panelists: *TBA*

Housing and Registration Information

Rogal America is handling all housing arrangements. Its booth will be located in the Registration Area of McCormick Place. All housing questions should be directed to Rogal.

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Hotel reservation acknowledgements will be sent directly to you from Rogal. Any hotel changes or cancellations must be made directly through Rogal. Do not call the hotels directly. Hotel changes or cancellations can be made by mail, or fax 617/965-2729, Telex 413053 ROGALAM, or call 617/965-8000 or 1-800-553-0505.

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A hotel deposit is required for each hotel room/suite requested. The deposit must be submitted with the Official Housing/Registration Form. Forms are date-stamped and processed on a first-come, first-serve basis. All rooms must have a deposit in the amount of one night's lodging. The deposit may be in the form of a major credit card or a check payable to Rogal America Inc. (The Oxford House accepts only a check or money order as deposit).

Registration Deadlines

The SUPERCOMM '92 deadline is May 15, 1992. After this date, registrations for SUPERCOMM will not be honored, and you will not receive your badge by mail. Please register on site. ICC '92 registration will be accepted until one week before the conference. Housing will be available on a space available basis.

SUPERCOMM '92 Registration

For SUPERCOMM '92 only, fill in the registration and housing information and mail with hotel deposit. Badges will be mailed (USA and Canadian addresses only) to all SUPERCOMM attendees, so please provide the complete correct mailing address for each registrant. You will receive your badge approximately two weeks prior to the show. If you do not receive your badge, please register on site.

Foreign badges will not be mailed. Please pick up your badge at the McCormick Place registration booth.

ICC '92 Registration

To register for ICC '92 sessions, please fill in the ICC '92 Registration Fees section in addition to the housing/registration information. Please include a check or payment for the ICC '92 sessions. Make checks payable to ICC '92. Important: If paying by check, separate checks for housing and registration fees must be sent. Payment in U.S. dollars only.

Discount Airline and Car Rental Information

American Airlines is designated as the SUPERCOMM '92 and ICC '92 preferred airline. To book your reservations, please contact Himmel & Associates at 1-800-328-6898 and identify yourself as an attendee. Reduced airfares are offered on most airlines, so call early. If calling from overseas, (312) 236-6470; from Canada, 1-800-621-2386; or fax your travel request to (312) 236-0377.

Please support the SUPERCOMM and ICC programs by allowing Himmel & Associates to handle your travel arrangements. By doing so you will help our programs and be eligible to win two free tickets in the continental U.S.

Alamo Rent-a-Car
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Mail forms to: Rogal America Inc.
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24 Consultants & Architects
25 Financial & Leasing Companies
26 Data Communications Equipment Manufacturers
27 Data Communications Services
28 Telecommunications Associations

Telecom Users
29 Educational
30 Financial/Investment
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32 Hotel/Motel
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37 Research & Development
38 Stadiums/Convention Centers
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Registration For SUPERCOMM '92 Seminars And Exhibition Is *FREE* ❑

Registration Fees For ICC '92

	Before May 25	After May 25	TOTAL	CODE
IEEE, USTA, or TIA MEMBER REGISTRATION				
1 Full – Includes all Sessions, Record, Exhibits, Awards Luncheon, Banquet	$275	$325	$ _____	1
2 LIMITED – Includes all Sessions, Exhibits, Record	190	230	_____	2
3 1-DAY – Includes all Sessions, Exhibits (Circle one: MON TUES WED)	145	145	_____	3
4 LIFE MEMBER – Includes all Sessions, Exhibits	5	5	_____	4
NON-MEMBER REGISTRATION				
5 FULL – Includes all Sessions, Record, Exhibits, Awards Luncheon, Banquet	$375	$425	_____	5
6 LIMITED – Includes all Sessions, Exhibits, Record	290	330	_____	6
7 1-DAY – Includes all Sessions, Exhibits (Circle one: MDN TUES WED)	245	245	_____	7
OTHER				
8 SERIES 200 SESSIONS DNLY, Exhibits	$ 70	$ 90	$ _____	8
9 STUDENT – Includes all Sessions, Exhibits	5	5	_____	9
OPTIONS *(In addition to items included in Registration Fee above)*				
A Tutorial # 1 – Broadband Networking (Monday all day)	$135	$155	$ _____	A
B Tutorial # 2 – Broadband Services and Industrial Applications (Tuesday all day)	135	155	_____	B
C Tutorial # 3 – Spread Spectrum Systems (Wednesday all day)	135	155	_____	C
D Tutorial # 4 – Satellite ISDN (Wednesday all day)	135	155	_____	D
E Tutorial # 5 – Telecommunications Management Networks (Monday morning)	60	70	_____	E
F Tutorial # 6 – Signalling System #7 for Fixed & Mobile Networks (Monday afternoon)	60	70	_____	F
G Workshop # 1 – Network Synchronization (Tuesday morning)	60	70	_____	G
H Workshop # 2 – Technology Management (Tuesday afternoon)	60	70	_____	H
I Gigabit Networking Workshop (Tuesday and Wednesday)	295	395	_____	I
K Awards Luncheon (Monday) QTY_____	35	40	_____	K
L Conference Banquet (Tuesday) QTY_____	50	55	_____	L
M Addl. Conference Record QTY_____	70	85	_____	M
N Shipping Conf. Record QTY_____ *(To listed street address – U.S. only)*	15	15	_____	N
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D Quality Management for Customer Satisfaction (Monday afternoon)		(free of charge)		O
P Global Information Architecture (Tuesday morning)		(free of charge)		P
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Q Chicago Highlights/Dceanarium (Monday morning) QTY_____	$ 25	$ 30	$ _____	Q
R Monday Night at the Museum QTY_____	43	48	_____	R
S Highlights, Chicago's Gold Coast (Tuesday morning) QTY_____	24	29	_____	S
T Cooking Demonstration (Tuesday afternoon) QTY_____		(free of charge)		T
U Art Institute/Shopping (Wednesday morning) QTY_____	23	28	_____	U
TOTAL REMITTANCE Must be in U.S. Dollars *(No refunds for cancellations after May 25, 1992)*			$ _____	

METHOD OF PAYMENT (Registration and Hotel)

❑ Check *(must use separate checks for ICC '92 registration and hotel deposit)*

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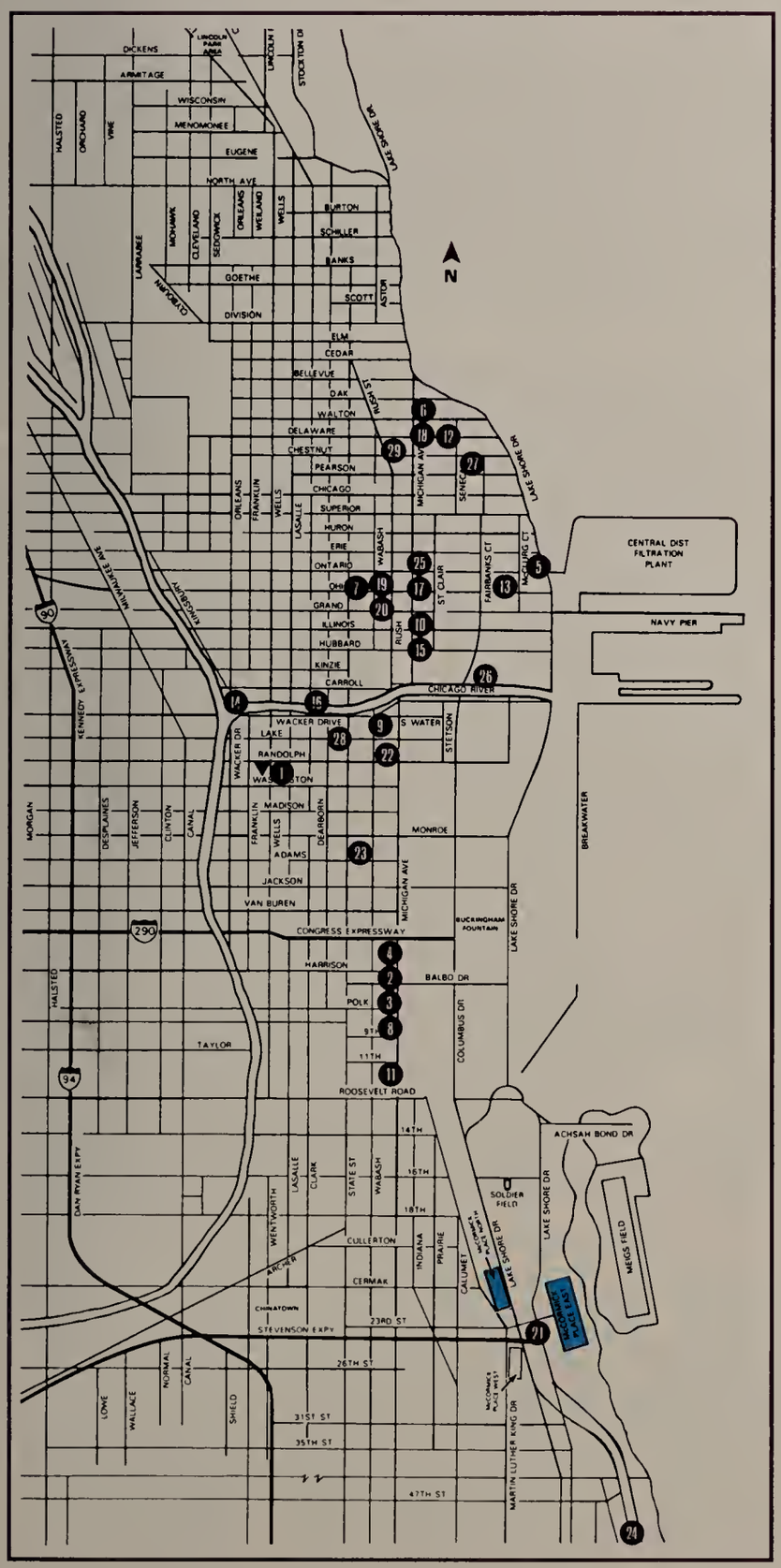
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Chicago, IL USA 60601-7524
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Fax: (312) 782-3617
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Downtown Chicago



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3	**Chicago Hilton & Towers** 720 S. Michigan Ave. (ICC '92 Headquarters Hotel)	1000	$140 $205	$165 $230
4	**The Congress Hotel** 520 S. Michigan Ave.	150	$ 95	$105
5	**Days Inn** 644 N. Lake Shore Drive	150	$ 99	$109
6	**The Drake** 140 E. Walton Place	150	$175	$210
7	**Embassy Suites** 600 N. State Street	100	$155	$155
8	**Essex Inn** 800 S. Michigan Avenue	200	$ 92 $106	$102 $112
9	**Executive House** 71 E. Wacker Drive	250	$120	$135
10	**Forum Hotel** 525 N. Michigan Ave.	300	$119	$139
11	**Grant Park Hotel** (Best Western) 1100 S. Michigan Ave.	150	$ 80	
12	**Guest Quarters** 198 E. Delaware Place	150	$160	$185
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15	**Hotel Intercontinental** 505 N. Michigan Ave.	200	$169	$189
16	**Hotel Nikko** 320 N. Dearborn	200	$185	$200
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23	**Palmer House Hilton** 17 E. Monroe Street	900	$119	$119
24	**Ramada, Lake Shore** 4900 S. Lake Shore Drive	150	$ 79	$ 89
25	**The Richmont Hotel** 162 E. Ontario Street	100	$115	$127
26	**Sheraton Chicago** 301 E. North Water Street	700	$163 $191	$191 $219
27	**Sheraton Plaza** 160 E. Huron	150	$149	$169
28	**Stouffer Riviere** One W. Wacker Dr.	285	$170	$170
29	**The Tremont** 100 E. Chestnut St.	50	$149	$159

End users examine converging public, private networks

COLIN UNGARO, *Network World* Publisher

SUPERCOMM '92 and ICC '92 co-locate as one of the most important events of the year for corporate telecommunications and MIS managers. The world of telecommunications, divided at approximately the time of divestiture into distinct public network and private network spheres, is growing back together again.

SUPERCOMM '92 is the best industry forum to examine the implications of this crucial change in the industry, a change that promises to increase the choices open to corporate telecommunications and MIS managers.

SUPERCOMM '92 will be held June 15-18 at McCormick Place in Chicago. It will be the largest telecommunications trade show held in 1992. And it will be the premier show of the year in terms of bringing end users, service providers and technology developers together under one roof at one time.

SUPERCOMM '92 will offer three types of learning opportunities for end users.

First, the key industry vendors will be demonstrating the latest technology available to end users on the show floor. Public and private networks share a common technology base. In the past several years, public network operators and their technology providers have worked diligently to make the public network better suited to meet the specific requirements of end users.

SUPERCOMM also attracts many of the pivotal technology providers that focus exclusively on the private network.

Second, SUPERCOMM features a comprehensive seminar program. A series of seminars has been tailored specifically for corporate telecommunications and MIS managers. Subjects will appeal to the most sophisticated and knowledgeable attendees, as well as attendees who are just beginning to master the material.

Third, SUPERCOMM offers an absolutely unique opportunity for telecommunications professionals from all branches of the industry to meet informally and discuss the state of the industry. In an industry that changes as rapidly as telecommunications, the ability for professionals to meet and talk is a real benefit, because coping with change is the name of the game.

The telecommunications industry has undergone dramatic shifts in the past decade. About 10 years ago, many end users discovered technology that would significantly improve their operations was available, but that frequently they had to acquire that technology themselves. The private network industry was born. This discovery greatly increased the options open to corporate users. But it also greatly complicated their operations. Private network users enjoyed the benefits of superb technology and network control, but were burdened with new and unfamiliar responsibilities like network planning, maintenance, testing and modernization.

Further complicating the situation is the rapid pace of change in telecommunications technology. A capability that is state of the art one year frequently is supplanted by a more recent innovation by the next year. Consequently, users with private networks can find themselves on a par with—or behind—the technology curve only months after they were clearly ahead of it.

For most of the past decade, the distinction between public and private networks was sharp. Driven by changes in technology and in the responsiveness of the carriers themselves, that dichotomy is now changing. The point is not that private networks are becoming less powerful. They, in fact, are becoming more powerful as private network suppliers move quickly to take advantage of the latest technological wrinkles. The point is that public network operators are moving more quickly than they have in the past to take advantage of technological progress. Local exchange carriers are expending considerable energy in their efforts to become much more responsive to the needs of corporations.

The emerging structure of the industry will not resemble the old days when there was a single choice for corporate end users nor will it resemble the previous decade when public and private networks co-existed but were clearly separate. The new structure will see a renewal of the public network resource that will allow the private network portion of the industry to focus on developing and supplying premium capabilities that the public network does not provide at a given moment or in a given place. The two types of network will function more constructively, providing corporate users with maximum choice, premium technology and superior cost effectiveness.

SUPERCOMM '92 will explore the shape of the emerging industry for telecommunications and MIS managers. It is the only industry event in 1992 consciously structured to inform telecommunications and MIS managers about this new industry—and, thus, help them make the best possible choices about their responsibilities. The program features excellent seminars tailored to user concerns. See those noted on page 19 as being of special interest. There is no charge for the seminars at the 100 level.

In addition, SUPERCOMM will feature a special two-day workshop on gigabit networking. This workshop is co-sponsored by the USTA, TIA and IEEE Communications Society. Presented June 16-17, it will cost $295 for preregistered attendees and $395 after May 25.

SUPERCOMM '92 is shaping up as a major convergence of technology and informed conversation for the entire industry—particularly corporate telecommunications and MIS managers.

Our success in tomorrow's global economy will depend upon our ability to educate our young people effectively today. And communications technologies will play a critical role in teaching, training and guiding the world's future citizens and leaders.

At SUPERCOMM/ICC '92, Ameritech, Ameritech Bell companies and other technology providers will present SuperSchool, a hands-on centerpiece display that will allow its visitors to experience the benefits telecommunications can bring to education.

SuperSchool will demonstrate applications based on current technologies that show how knowledge and education can be easily and effectively delivered and administered to virtually everyone — in the classroom or library, at home or at the office.

SuperSchool will show applications like distance learning, networking of audiovisual and computer-aided teaching tools, and ways students and instructors can access a world of multimedia educational information.

These are only a few of the many fascinating applications you'll find in SuperSchool. Make it a must-see on your agenda at SUPERCOMM/ICC '92, McCormick Place in Chicago, June 16-18. Admission is free to registered show attendees.

SuperSchool — showing America's educators, business leaders and government officials how to unlock the future of education.

SuperSchool

at *SUPERCOMM/ICC '92*

Unlocking The Future



Reasons abound for international travel to Chicago

LARRY LANNON, *Telephony* Publisher

SUPERCOMM/ICC '92 will reflect the rapid globalization of the telecommunications industry in both the seminar and the exhibition portions of the event. Held in Chicago, June 15-18, SUPERCOMM will have plenty to offer attendees from around the world. Both the seminar program and the exposition are based on the internationally recognized change that is reshaping the fundamental structure of the telecommunications industry: namely the rapid shift from an industry organized along national lines to an industry organized along global lines.

That shift is being driven by four key factors.

First, telecommunications users, particularly in the business community, are demanding voice and data services that allow them to communicate as easily across the world as they can across town. Second, service providers, in order to maintain their important business relationships with sophisticated users, are responding by competing to meet—and even anticipate—demands for global service. So the industry is witnessing a textbook confluence of demand and supply that is reshaping the industry's map.

The other two factors are no less important. They are the common, transnational foundation of the industry, its basic technologies. Despite some minor differences in language—for instance, the use of the term sychronous optical network in the U.S. and synchronous digital hierarchy in Europe to signify the same thing—and more serious differences in standards, the international industry depends on common technical building blocks. Technical developments in one region of the world are eagerly sought and soon deployed elsewhere. Shortly they are available everywhere.

The fourth and final factor driving the industry's rapid globalization is the increasingly global nature of the competition among technology developers. As the technology has become ever more sophisticated, research and development costs have soared. Manufacturers have a powerful economic imperative to sell these R&D-intensive products on as wide a scale as possible in order to fund the next round of R&D investments. Concurrently, most national markets have been opened to international competition. Both factors have served as powerful motivators for manufacturers large and less large to operate on an international scale. In today's pitiless business environment, there is no substitute for a global marketing effort.

Examples of the technology developed for the international industry will abound at SUPERCOMM '92. Among the technology areas that are as critical to telecommunications, both private and public, in Europe and Asia as they are in New York and California are broadband, test and measurement, network management, operations support systems, videoconferencing, satellite, gigabit networks and multiplexers, not to mention power and energy, cabinetry, cross-connects, loop carrier and microwave. Don't forget fiber in the loop, wireless, packet, intelligent network and integrated services digital network technology either.

In other words, any telecommunications technology or product being used or sought in any part of the world is sure to be on display at SUPERCOMM '92.

And the exhibition, rich as it is in information, is only half the SUPERCOMM knowledge equation. The second part is the seminar program.

The seminar program includes free 100 level seminars for general audiences.

Every conceivable telecommunications technology subject will be covered, including SONET/SDH, broadband, network management, satellite and wireless. International attendees can profit handsomely from all technology subjects. In addition, a wide array of operational, business and marketing subjects will be addressed in the seminar program, most of which will be highly relevant to international attendees.

A group of four Monday sessions has been created that is targeted specifically at international attendees. Sessions include European digital cellular, a "Report Card on Investments in International Telecommunications," and opportunities in the Asia/Pacific and Caribbean telecommunications market. On Wednesday, international attendees can attend a session devoted to new international services for corporate users.

Also available are the 200, 300 and 400 level offerings of ICC '92, for which there is a moderate fee. The 200 series are technical, but still for general audiences; the 300 level sessions, organized by the ICC, include sessions devoted to communications satellite technologies, global information architecture and the global quest for quality. All will be pertinent to the concerns of global attendees.

SUPERCOMM/ICC '92 truly is the best venue of the year for the international telecommunications professional.



Faced with a world of network decisions? Commission the work of a global artist.

While others wrestle with decisions, the artist sees with impressive clarity. Armed with a clear sense of purpose and a desire to create, the artisan works tirelessly to transform a fleeting thought into a three-dimensional object.

Like fine art, complex networks also have their beginnings in the mind of a visionary. And who better than an artist to help bring an idea to life?

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Exhibitors

as of February 7

Floor Plan on pages 40-41

A-B

ACS Communications Inc. **972**
ACT Print Systems **266**
ADC Telecommunications Inc. **845**
Adirondack Wire & Cable **2119**
ADK Pressure Equipment Corp. **1465-68**
ADSCO Line Products **821-22**
Adtran **1052**
Alcatel **126**
Alcoa Fujikura Ltd. **661**
Alpha Technologies **1313-14**
American Computer & Electronics Corp. **966-67**
American Digital Switching **649**
American Electric **1620**
Ameritec Corp. **628-29**
Ameritech International **1228**
AMP **2222**
Anritsu America **249**
ANT Telecom **2640-41**
AOFR Inc. **318**
Applied Computing Devices **1352**
Applied Digital Access Inc. **740-41**
Applied Innovation **1718-19**
ARNCO Corp. **257-58/357-58**
Ascom Warren **622**
AT&T Network Systems **1070**
AudioSears **2120**
Augat Communications Group **1552**
Bally Engineered Structures **1619**
Bard Manufacturing **1920-21**
Beco Manufacturing Corp. **116**
Bell Atlantic **1846**
Bellcore **2432**
BellSouth **634**
Benner-Nawman **825**
Berry Co. **1209**
Boston Technology Inc. **552-53**
BroadBand Technologies **336**
Burnup & Sims Communications Services Inc. **264**
Business Communications Review **1012**
Butler Telecom Inc. **1671**

C-D

C&D Charter Power Systems **840-42**
CADTEL Systems Inc. **546-47**
CANAC Telecom **1311**
CANADA, External Affairs & International Trade **410/610**
Canoga-Perkins **912**
CAPS Logistics **2020-21**
Carlon, a Division of Lamson & Sessions **605**
Carsonite International **1212**
C-Can Power Systems Inc. **2259**
CEECO **906-07**
CERJAC Inc. **658**
Channell Commercial **2210**
Cincinnati Bell Information Systems **2249**
Coastcom **1022-23**
Code-A-Phone **1118-19**
Cognitronics **1322-23**
Coil Sales & Manufacturing **216**
Comdial Corp. **746-47**
Commercial Electric Products **1512-13**
COMMSOFT **2826**
Communication Equipment Brokers **2109-10**
Communications Data Group **1013-14**
Communications Manufacturing Co. **1167-68**
Communications News **2652**
Communications Week/CMP Publications **742-43**
Communico Supply, a Division of Communico Inc. **806-07**
Communitech Inc. **2643**
Comshare **1622-23**
Comunicaciones **107**
Concrete Systems Inc. **2121**
Condumux Inc. **923**
Consultronics Ltd. **2013**
Cordell Manufacturing **1625**
Crispaire Corp. **1820**
Crowe Rope **922**
Datacom Technologies Inc. **2206**
Datapro Information Services Group **1768**
DBA Communications Systems Inc. **117-18**
DCM Industries **809-10**
Dielectric Communications **2011**
Digital Transmission Systems **1910-11**
Digitech Industries **1668-69**
Ditch Witch **428**
DSC Communications **833**
Dukane Corp. **459**
Dura-Line **1916-17**
Dynacom **2242-43**

continued on page 38


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Exhibitors

E-G

Easi File Corp. **808**
East Penn Manufacturing Co. Inc. **1674-75**
ECI Telecom **1869**
EDS **1837**
Electrodata **1108-09**
Electronic Tele-Communications **1244**
Elgin Electronics **1913-14**
Enghouse Systems **449**
Ericsson Components **2112**
Ericsson Network Systems **2409/2810-14**
Evergood Fabrication Co. Inc. **457-58**
Excel Inc. **2069**
EXFO E.O. Engineering **2057**
Famous Telephone Supply Co. **2428**
FiberCorp Inc. **1433**
Fibrebond Corp. **1210**
Fishel Co. **1112**
Fitel General **440**
FOF Products **818-19**
Forces Inc. **110**
Fortec **1006-07**
Fujitsu Network Transmission Systems Inc. **204**
FWT **920-21**
Generac Corp. **1644**
GMP **1407-08**
GNB Industrial Battery **1636-38**
GN Navtel Ltd. **1857**
GN Netcom **843**
Gordon Kapes Inc. **667**
Grand Enterprises Inc. **218**
Graphic & Data Solutions **2555-56**
Grass Valley Group **1225**
Graybar Electric **2216**
GTE Corp. **1336**
GTE Products
GTE Supply
GTE TestMark

H-L

Harris/Dracon **1133**
Harris-McBurney **968**
Hartford Concrete **1056**
Harting Elektronik Inc. **753**
Heath Consultants **1670**
Hekimian Laboratories **332**
HELLERMANN **865**
Hendry Telephone Products **1165-66**
Henkels & McCoy **1722-23**
Hewlett-Packard **1864**
Homaco **1707-08**
Hood Communications **319**
HUB Fabricating Co. **2420**
Hysol Division, The Dexter Corp. **1607-08**
Ideal Industries **1509-10**
IEEE Communications Society **1810-14**
Imaging Magazine **2203-04**
Inbound/Outbound Magazine **2203-04**
Independent Technologies **1067-68**
Industrial Technology **916-17**
Information Publishing **2010**
Integrated Network Corp. **1860**
Intergraph Corp. **2620**
Iowa Department of Economic Development **1769**
John Wiley & Sons **2816**
Johnson Controls,
Specialty Battery Division **1417-18**
Joslyn Electronic Systems **1465-68**
Keptel **637**
Klein Tools **1010-11**
Kohler Co. **965**
Kontek Industries Inc. **1609-10**
LaMarche Manufacturing Co. **1413-14**
Lancier Inc. **1912**
Larus **2258**
Laser Precision **1110-11**
Leviton Manufacturing **1409-10**
Liebert Corp. **1267**
Linkon **1018-19**
Logica North America Inc. **1264**
LorTec Power Systems/IPM **1064**
Lynn Electronics **1211**

M-N

Macrotel International **1441**
Magnetek **111-12**
Mark Products **764**
Masterack, a Division of Leggett & Platt **1733-38**
Matt M. LaVail Inc. **707**
Metro Tel **1116-17**
Metrotech **1008**
Micro Computer Systems **2046**
Micro Integrated Communications Corp. **1621**
Microflect **1711**
Microtronix Systems **813-14**
Microwave Logic **910-11**
Microwave Networks **2213**
Mobile International **1519**
Modular Protection Group **1514**
Mohawk Wire & Cable Corp. **1016**
Motorola **2234**
Mountain Engineering & Technology **2742**
Mustang Enterprises **864**
NEC America **2445**
NEPTCO **1618**

continued on page 42

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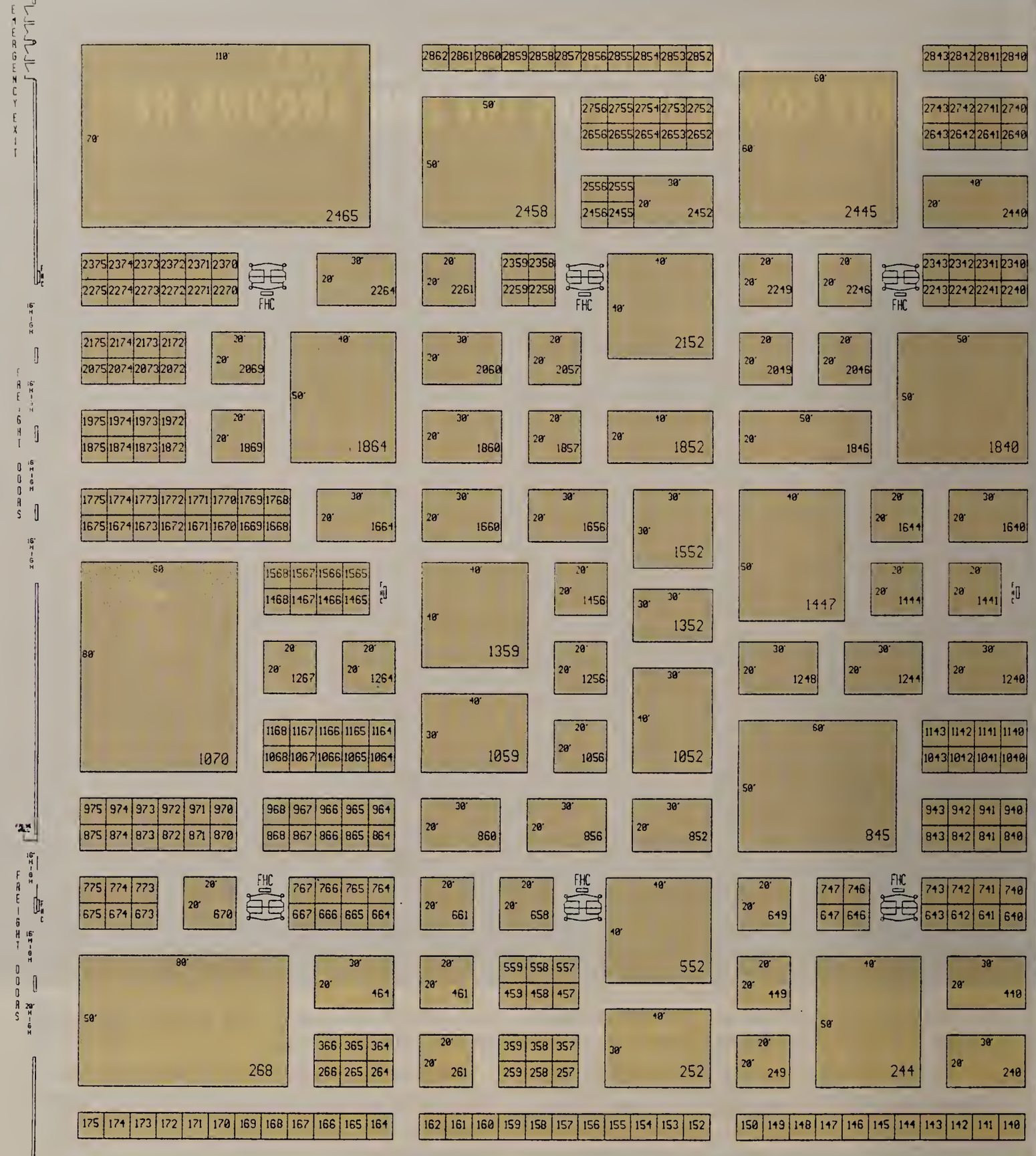


Exhibit Floor Plan



McCormick Place, Chicago

Exhibitors

Network Communications **1256**
Network World **1507-08**
Networking Management Magazine **2016-17**
Nevada Bell **642-43**
Nippon Telegraph and Telephone Corp. **1216**
Nippondenso of Los Angeles Inc. **664**
North Supply **416**
Northern Telecom **2465**
NovAtel Communications **1425**
Noyes Fiber Systems **706**
Nutmeg Utility Products **1411-12**

O-R

Octel Communications Corp. **1248**
OMNI **1021**
Onan Corp. **1825**
ONEAC **2113-14**
Outside Plant Magazine **1568**
Pacific Microelectronics Centre **219**
PairGain Technologies **2246**
Panamax **119**
Panduit Corp. **2752-53**
Para Systems Inc. **2012**
Pen-Cell Plastics **1713-14**
Peninsula Engineering Group **1009**
Periphonics **913-14**
Photon Kinetics **1456**
Photonics Spectra **2642**
Pirelli Cable Corp. **860**
Plug-In Storage Systems **2455-56**
Porta Systems Corp. **1640**
Power & Telephone Supply Co. **1565-66**
Power Battery Co. **631**
Power Conversion Products **1222-23**

SUPERCOMM Celebrates Success

Interested in exhibiting in Chicago? There may still be space at SUPERCOMM '92. Contact Ben Stauffer at our contractor, E.J. Krause & Associates, 7315 Wisconsin Ave., Suite 420 East, Bethesda, Md., USA, 20814. Phone (301) 986-7800, Fax (301) 986-4538 or Telex 4944944 EJK EXPO.

Also be aware that space even now is being spoken for at SUPERCOMM '93. Building on five years of enormous success, we're already scheduled through 2000, but here are the next few important dates:

'93 Atlanta (with Telocator) April 19-22

'94 New Orleans (with ICC) May 2-5

'95 Anaheim March 20-23

Powersafe Standby Batteries **1065-66**
Preformed Line Products **1025**
Progressive Computing **1517-18**
Protek Inc. **2607**
Protel **2342-43**
PSI Telecommunications **2037**
Publishers for Conventions **1309**
Pulsecom Division, Hubbell Inc. **1828**
Pyramid Industries **145**
Quadrum Telecom **1140-42**
Quantel Systems Inc. **673**
Quazite **767**
Quintrex Data Systems **2340-41**
Radiation Systems/Mark Antennas Division **2111**
Radiodetection Corp. **1821**
Rainbow Technology **1922-23**
Random Corp. **2122-23**
Ratelco **1822-23**
Raynet Corp. **1359**
Redcom Laboratories **1059**
Regal Electronics **1312**
Reliable Communications Group **359**
Reliance Comm/Tec **1447**
Remote Switch Systems **703-04**
R.J. Enterprises **2014**
Roadrunners International **1421**
Rockwell Switching Systems Division **1660**
Rycom Instruments **1712**

S

Saft Nife Corp. **1143**
Saunders Telecom **2755-56**
Schonstedt Instrument **1164**
Science Dynamics **2240-41**
Scientific-Atlanta **2736**
Seiscor Technologies **2152**
Services & Materials Co. **114**
Siecor Corp. **1852**
Siemens Solar Industries **670**
Siemens Stromberg-Carlson **268**
Sierra/LSI Jennings **918-19**
Silton Co. **646**
SNC Manufacturing **1213-14**
Sparton Technology **765**
Sprayon Products **2009**
Starkey Telecommunications **970**
Storm Products Co. **941**
StrataCom Inc. **2423**
Stratus Computer **2416**
Sumitomo Electric Fiber Optics **2452**
Summa Four **1444**
Superior Teletec **2261**
Suttle Apparatus **603-04**
Switchcraft **261**
System Studies Inc. **2653-54**

T-Z

T.A. Pelsue **2116-17**
Tadiran Electronic Industries Inc. **210**
Talcom Systems Ltd. **128-30**
Tamaqua Cable Products **1321**
Tandem Computers **2128**
Tau-Tron **1656**
T-Com **1716-17**
Tekelec **2732**
Tekno Industries Inc. **1611-12**
Tektronix **852**
Tel electronics **2018-19**
Telamon **1419**
Telco Intercontinental **1310**
Telco Systems **2436**
Telcor **940**
Telecom Gear **2808**
Telecom Solutions **1664**
Telecommunications Industry Association **1421**
Telecommunications Magazine/ C&C News **1207-08**
Telecommunications Techniques **228**
Teleconnect Magazine **2203-04**
TELECT **2440**
Telenex **908-09**
Telephone Engineer & Management **1106-07**
Telephone International **1616-17**
Telephony Magazine, a Division of Intertec Publishing **728-30**
TeleSciences **1833**
Tellabs **2458**
Teltone **1816-17**
Teltrend **2237**
Tempo Research **1613**
Teradyne Inc.-Telecomm Division **1136**
Test Technology Inc. **811-12**
Texas Instruments **2060**
The Mart Magazine **2407**
Thomas & Betts **1040-43**
THOR Enterprises Inc. **1614**
3M Telecom Systems Group **828**
Time Manufacturing **2025**
TranSwitch Corp. **731**
Trimm Inc. **630**
Triplett Corp. **964**
Trompeter Electronics **1819**
TW Comcorp **1709-10**
Tyton **1818**
Underwriters Laboratories Inc. **973**
Unipage **705**
Unisys **1240**
United States Telephone Association **1421**
U.S. Intelco Networks **606-07**
Vari-Tronics **2022-23**
VFP **1122-23**
VIDAR Inc. **1972-73**
Virgo Publishing **820**
Wandel & Goltermann **823**
Westell **942-43**
Wheelock **816-17**
Wicom **2118**
Wilmore Electronics Co. **1020**
Wiltron **1633-35**
York Group, The/MDL Enterprises Inc. **2819**
Yuasa-Exide Inc. **1113-14**

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Gigabit Networking Workshop for Private Network Administrators

Sign up today for the two-day workshop dealing with ultra high-speed data and communications applications for large network users. This workshop, "Gigabit Networking: Who Needs It? Applications and Business Impacts," will be held at McCormick Place during SUPERCOMM/ICC '92 in Chicago on Tuesday and Wednesday, June 16-17.

Fiber optic networks have opened up the practicality of ultra high-speed transport facilities. Research and development is under way to extend this capability into practical networks that will operate at speeds of one gigabit, or one billion bits, per second or higher.

The resulting ultra high-speed digital networks will enable many new and exciting applications in medical, education, military, financial, R&D, and other communities. Many challenges, technical and otherwise, face planners in developing practical networks to exploit the potential business opportunities.

SUPERCOMM's co-sponsors, the U.S. Telephone Association and Telecommunications Industry Association, are joining with the IEEE Communications Society to provide this workshop. It will focus on enabling applications, extending computer room solutions to enterprise networks, architectural implications of applications, and organizational shifts and economics of gigabit networks.

The event's presentations and discussions will take place from 8:30 a.m. to 2:00 p.m. Tuesday and Wednesday. Some activities will also be scheduled during the lunch hour. As part of the registration fee, you may attend (free) afternoon exhibits, which will stress ultra high-speed networks and specific applications at the co-located SUPERCOMM '92, or attend a variety of technical sessions offered Monday through Wednesday at ICC '92. You may also participate in any of the 43 SUPERCOMM seminars Monday through Thursday, as part of your gigabit workshop registration.

Gigabit Workshop Goals:

- Identify key applications and opportunities offered by ultra high-speed networks
- Discuss the impact and economics of these applications on network and computer architectures
- Identify the likely directions of architectures and business opportunities

Registration:

The gigabit workshop registration fee is $295 (U.S. funds) or $395 after May 25. Attendance will be limited to 350 participants on a first-come, first-served basis for this in-depth private networking workshop, so please act promptly. Preregister using the form on page 30A of this brochure—line I, or Phone (212) 705-7018, Fax (212) 705-7865 for additional information.

TUESDAY, JUNE 16

Mini-Theme I:
System Applications and Experiences

Views by users, equipment vendors and service providers reporting on applications based on extensions of today's computer room solutions. They will discuss enabling applications and technologies that are making paradigm shifts possible in the global enterprise network.

8:30 - 9:00 a.m.

Theme Speaker—I:
So Who Needs A Gigabit Network Anyway?

Theme Speaker: *TBA*

9:00 - 10:30 a.m.

Session 1:
Extending Computer Room Solutions to Enterprise Networks

The emergence of powerful desktop workstations, together with distributed computing and multimedia information, will stimulate the establishment of enterprise-wide gigabit networks. The speakers will share their experience and forecast trends.

Organizers: *Nim Cheung, Executive Director-Transwitching Research, Bellcore; Tom Browne, Executive Director- Corporate Telecommunications, Bellcore*

Chairman: *Jonathan Turner, Professor of Computer Science, Washington University*

1a-Creative Applications of Large Bandwidth in Enterprise Networks: *Martin Nisenholtz, Senior Vice President, Ogilvy and Mather*

1b-Decentralizing and Re-engineering Work Functions: *Dan Schutzer, Vice President-Advanced Technology, Citicorp*

1c-Applications of New Electronic Imaging Technologies in Enterprise Networks: *Bob Sanderson, Director of Research, Eastman Kodak*

1d-The Role of High-Capacity Networks in Manufacturing: *Kevin Conlin, Consultant*

Panel discussion on above

10:30 a.m.

Coffee

10:50 a.m. - 12:20 p.m.

Session 2:
Paradigm Shifts—Enabling Applications

The session focuses on various applications being developed and considered to create exciting and thought-provoking paradigm shifts worldwide. Covered will be applications that will benefit from gigabit networks, major changes in lifestyle envisioned and impact on business order.

Organizer: *Tom Appleby, Manager-Network Strategic Planning, BellSouth Telecommunications*

Chairman: *Scott Esty, Manager-New Market Development, Corning Inc.*

2a-Enterprise Medical Applications: *Anthony Gorry, Vice President-Information Technology, Baylor College of Medicine*

2b-Network Access to Education Resources: *Warren Gifford, Executive Director-Broadband Services Research, Bellcore*

2c-Supercomputers—Will Gigabit Networks Allow Useful Applications?: *TBA*

2d-Strategic Advantage—The Global Enterprise Network: *Lawrence Vanston, Partner, Technology Futures Inc.*

Panel discussion on above

12:30 p.m.

Chicago Room
Lunch

1:30 p.m.

Luncheon Speaker I:
Networking Needs for Large Private Enterprise Networks

Luncheon speaker: *TBA*

2:00 - 5:00 p.m.

McCormick North
Exhibits and Sessions

View applications from various vendors on broadband solutions that are available today or attend related SUPERCOMM/ICC '92 sessions.

WEDNESDAY, JUNE 17

Mini-Theme II:
Economics, Benefits and Organizational Impacts

Views by users, equipment vendors, and service providers reporting on enablers, organizational shifts, architectural implications, economics and roadmap on "How to Get There from Here."

8:30 - 9:00 a.m.

Theme Speaker—II:
Can We Get There à la "ARPA NET"?

Theme Speaker: *William Burr, Engineer, NIST*

9:00 - 10:30 a.m.

Session 3:
Enablers, Organizational Shifts and Economics of Gigabit Networks

The availability of gigabit networks and their use for high-performance applications will have a number of impacts on the way in which business is conducted, including economic and regulatory. This session examines the issues and effects of this technology on the organization, society and user.

Organizer: *James Sterbenz, Advisory Engineer/Scientist-High Performance Computing and Communications, IBM*

Chairman: *Ira Richer, Consulting Engineer, The Mitre Corp.*

3a-Need for a New Software Platform Enabling Multimedia Network Services: *David Nagel, Senior Vice President- Technology, Apple Computer*

3b-Interactive Multimedia Information Delivery: *Sanjaya Addanki, Senior Technical Consultant, IBM Research*

3c-Impact of Multimedia Applications on Traditional Telecommunication Regulation and Tariffs: *Stu Personick, Assistant Vice President-Information Networking Research, Bellcore*

3d-Changes in the Communications Environment-Private Networking and New Services by Carriers: *Hanafy Meleis, Technical Director-Corporate Backbone Networks, DEC*

Panel discussion on above

10:30 a.m.

Coffee

10:50 a.m. - 12:20 p.m.

Session 4:
Architectural Implications—"How to Get There from Here"

This session addresses the implications of ultra-broadband distributed applications on the major network elements. The speakers will also consider how and when migration to future gigabit networks will occur.

Organizer: *Ned Farinholt, Executive Staff-Advanced Systems, MCI*

Chairman: *Ed Jungerman, Chief Executive Officer, Impulse Telecommunications*

4a-Is Access a Problem?: *Dan Kelley, Senior Vice President, Hatfield Associates*

4b-A Carrier's Perspective—Circuits, Cells and SONET: *David McDysan, Executive Staff-Network Systems, MCI*

4c-The Workstation Provider's View—Bandwidth vs. Processing: *Geoffrey Baehr, Director for Networking and Data Communications, Sun Microsystems*

4d-The User's Viewpoint—Moving Large Files Fast: *John Sandberg, Director-Network Design, COMDISCO Disaster Recovery Service*

Panel discussion on above

12:30 p.m.

Chicago Room
Lunch

1:30 p.m.

Luncheon Speaker II:
Government Policy/Industry Stimulation

Luncheon Speaker: *Eugene Wong, Associate Director for Industrial Technology, Office of Science and Technology Policy, White House*

2:00 - 5:00 p.m.

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functionality to one or more of their routers last fall to support an OSI demonstration at the INTEROP 91 Fall conference in San Jose, Calif. The demonstration allowed show-goers to send X.400 messages across the internet using TCP as well as full-stack OSI protocols.

While most regional NSF nets have not dropped OSI support from their routers, service will eventually erode because the regional nets will not fix problems as they arise. Users must be willing to pay if they want the regional networks to maintain the functionality, according to Jordan.

Firm offers new insight into imaging

continued from page 21

the image database.

Users can use the location code to integrate images from Insight into other applications. For example, the 64-bit location code could be stored in a file maintained on a relational database management system on a remote host. When the file is delivered from the remote relational DBMS to an ICS/386 workstation, the ICS/386 software could use the location code to pull down an image associated with the file.

This would allow the workstation to display both the image and information from the relational DBMS file on the same screen. Image Data supplies application program interfaces that make it easier for programmers to integrate Insight with applications based on Oracle Corp.'s SQL Forms or the C programming language.

Instead of using Insight, users that want to integrate high-resolution images into existing applications could store the images in the same database they use to store other information.

But Richard Hasha, Image Data's director of image systems development, said that high-resolution image files typically are too large for existing DBMSs to handle efficiently. By contrast, Insight is optimized to manage image databases. According to Hasha, the IIS/4000 server can retrieve as many as three 85K-byte image files per second from an image database. IIS/4000 is also capable of supporting as many as 100 concurrent users.

Len Yencharis, owner of the Yencharis Consulting Group in Massapequa, N.Y., added that most other imaging systems are designed to work only with low-resolution images, such as legal documents. He said Insight is the only imaging file server system now designed to support high-resolution photographs and medical images.

Len Capelli, Image Data's sales manager for image systems, said the vendor plans to introduce the ability to move images between Insight and IBM's ImagePlus imaging system in the second quarter.

Insight is available now. The ICS/386 component costs $625 per workstation, IIS/4000 is priced at $46,000, and the Insight Capture Kit costs $5,500.

Distributed net pack looms on horizon

continued from page 21

types of processing over the network, including file transfers, message-level communications between applications, remote procedure calls or SQL queries.

To provide this level of interoperability between applications, Message Express initially will support protocols such as IBM's Advanced Program-to-Program Communications LU 6.2, DEC's DECnet, the Transmission Control Protocol/Internet Protocol, Named Pipes, IBM's Network Basic I/O System and Novell, Inc.'s Internetwork Packet Exchange/Sequenced Packet Exchange (IPX/SPX).

In a LAN environment, Message Express supports IBM's LAN Server and runs as a NetWare Loadable Module (NLM) with Novell's NetWare 3.11. It also includes configuration and management tools that define the parameters between applications' peer-to-peer communications.

The product can be used on a LAN in a client/server configuration, with many of the message queuing and transmission services still handled as a server process and the interface to the application running on a client workstation.

"Message Express delivers on the promise of distributed computing by providing a consistent interface for applications across a wide range of operating systems, platforms and protocols," said Hub Vandervoort, president of Horizons Strategies.

According to Vandervoort, most middleware offerings have been either vendor platform-specific or tied to a specific application and have not dealt with the interoperability issues associated with coordinating all the different processing operations that Message Express supports.

Message Express is available now, except for the NetWare NLM version, which will be available at the end of the month. Pricing depends on configuration but ranges from $595 for a PC version to $35,400 for a mainframe package.

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Worth Noting

IBM Chairman John Akers' pay for 1991 will be cut to under $1.6 million, 40% less than the year before, according to IBM's 1991 annual report. The decrease in his pay was tied to IBM reporting its first annual loss last year.

People & Positions

George Conrades, IBM's senior vice-president of corporate marketing and services and a member of the IBM Corporate Management Board, last week announced he will retire on March 1.

Conrades joined IBM in 1961 as a marketing representative in Columbus, Ohio.

He was once considered to be a possible heir to John Akers as chairman of IBM, but was transferred from his position as head of U.S sales last fall to his corporate marketing post, a move seen by industry observers as a demotion.

Conrades will evaluate other business opportunities upon his departure.

IBM has not announced a replacement.

William Porter recently was named president of **ADC Kentrox** and vice-president of **ADC Telecommunications, Inc.**, the parent company of ADC Kentrox.

ADC Kentrox is a Portland, Ore., maker of data communications equipment such as digital service unit/channel service units.

Previously, Porter was vice-president of national accounts at ADC Telecommunications.

Porter replaces Dan Kinney, who resigned in December.

XAPIA's X.400 API collection

1992 releases:	
API to Message Store	Provides interface between mail-enabled applications and X.400 Message Store.
Object Set for EDI	Tool for building EDI applications for X.400 nets.
1990 releases:	
API to Electronic Mail	Enables developers to build X.400 mail gateways.
API to Directory Services	Enables developers to build applications that query an X.500 directory.
OSI-Abstract Data Manipulation API	Defines mechanism for creating and accessing OSI gateway, application and directory objects when used with other XAPIA APIs.

API = Application program interface
XAPIA = X.400 API Association

SOURCE: XAPIA, MOUNTAIN VIEW, CALIF.
GRAPHIC BY SUSAN J. CHAMPENY

X.400 group releases APIs to spur E-mail applications

APIs translate into lower costs for developers.

By Bob Brown
Senior Editor

BOSTON — The X.400 Application Program Interface Association (XAPIA) recently announced two new APIs designed to speed the development and availability of X.400-based applications.

The APIs translate into lower costs by defining a common interface that developers can use to link applications to X.400 nets rather than devoting manpower and money to building their own API. These savings could be passed on to users in lower priced mail applications.

The XAPIA's new API to Message Store specifies a common means for front-end electronic mail applications to use X.400 in delivering messages across an enterprise. Similarly, the new Object Set for EDI specifies a common way to link electronic data interchange applications to X.400 nets.

The XAPIA is an organization of E-mail and computer vendors that was formed in 1989 to spur development of X.400-based E-mail applications. Members include Banyan Systems, Inc., IBM, Lotus Development Corp., Novell, Inc. and about 10 other firms.

The XAPIA's new API to Message Store is designed to let applications residing on client workstations easily submit and retrieve mail from the message store, which is the server-based E-mail buffer where messages are housed on an X.400 net.

The API will let developers build applications that automatically extract messages such as facsimile messages from the message store on any vendor's X.400 E-mail system rather than making a user plow through the entire message store to locate fax messages.

In addition, the API will eliminate the need for developers to configure custom links to multiple vendors' message stores.

"This is the first API [that the XAPIA has] released that supports client/server communications," said Niraj Jain, research and development project manager for Hewlett-Packard Co.'s X.400 messaging products.

Object Set for EDI is a set of specifications designed to help developers build applications that pass EDI data over X.400 networks. The object set is a collection of EDI object definitions as defined by X.435, the X.400 standard for EDI, which can be written into mail applications and then manipulated by XAPIA's other APIs, according to Ed Owens, chairman of XAPIA.

"This API is designed to help developers create X.435 applications," he said.

In the past, EDI messages have been packaged inside mail messages and treated on networks like other interpersonal messages, Owens said. Object Set for EDI will let developers build true EDI applications that will enable users to send EDI messages across X.400 nets in a more native format, he added.

Nina Burns, president of Network Marketing Solutions, a Menlo Park, Calif., consulting firm, said the XAPIA announcements are important in that they "address issues inhibiting X.400 from being more widely implemented."

U.S. condemns new EC telecom directive

Trade office labels rule as discriminatory against U.S. equipment suppliers, threatens sanctions.

By Ellen Messmer
Washington Correspondent

WASHINGTON, D.C. — A trade war is taking shape between the U.S. and the European Community over an EC directive on telecommunications equipment purchases, which the U.S. trade office recently condemned as discriminatory.

The Office of the U.S. Trade Representative is taking exception to the EC's Utilities Directive, charging that it favors domestic suppliers in EC member states over other telecommunications equipment makers.

U.S. Trade Representative Carla Hills said the U.S. has issued a 60-day deadline for the EC to agree to drop the directive — which is scheduled to take effect Jan. 1, 1993 — or face economic sanctions.

"We must make it clear that we will not stand by idly while the EC imposes discriminatory rules that harm American businesses and workers," Hills said.

A recently released report by Hills stated that the Utilities Directive would permit post, telegraph and telephone administrations in EC member states to reject any bids with foreign-supplied equipment that accounts for more than 50% of the total equipment cost.

Instead, the U.S. wants the EC to negotiate a new agreement for foreign trade with equal access to each country's telecommunications markets.

"Achieving a new agreement on a [General Agreement on Tariffs and Trade] code is a primary government procurement objective of the [Bush] administration," the U.S. trade office stated in its report.

The U.S. singled out France and Germany for discriminatory practices, saying their govern-

(continued on page 29)

INDUSTRY BRIEFS

Larse, Vitalink forge reseller pact. Larse Corp. of Santa Clara, Calif., and Vitalink Communications Corp. of Fremont, Calif., last week announced a reseller agreement under which Vitalink will sell Larse data communications equipment.

Vitalink will resell Larse's Split-T fractional T-1 access multiplexer and Access-T network access data service unit/channel service unit offerings via its direct sales force. The Larse products complement Vitalink's current line of local-area network internetworking products, which include bridges and routers.

United Telecom changes name. United Telecommunications, Inc. last week officially changed its name to the more recognizable Sprint Corp.

The change follows on the heels of United Telecom's purchase of the remaining 19.9% interest in US Sprint Communications Co. from GTE Corp. in January.

USConnect goes global. USConnect Partners, Inc., a partnership of network integrators and resellers, last week announced it has joined forces with three Canadian integrators as part of its new GlobalConnect international expansion strategy.

Under GlobalConnect, USConnect members and its international affiliates will be able to provide users with coordinated network integration services across a broader geographical area. USConnect plans to sign on new partners in Europe, Latin America and the Pacific Rim.

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Len Evenchik
Director of communications
Commonwealth of Massachusetts
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Association Watch

The Fifth International Computer Virus and Security Conference will be held March 11-13 at the New York Marriott Hotel. The conference is sponsored by the financial industries chapter of the **Data Processing Management Association** in conjunction with the **IEEE Computer Society** and **the Communications Managers Association.**

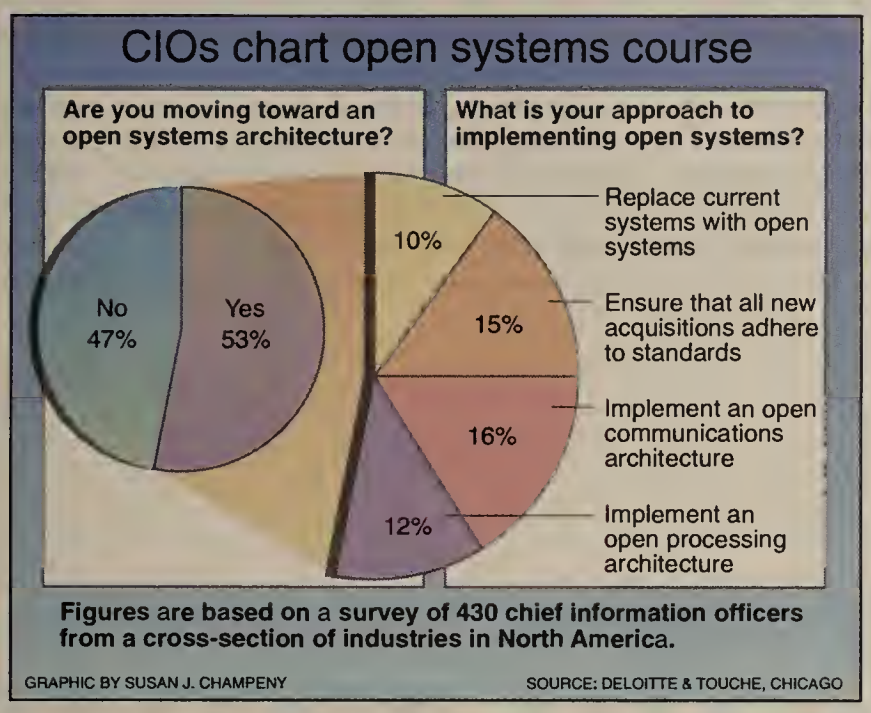
Conference sessions will address recent virus outbreaks and methods for prevention, detection and recovery from virus attacks, among other things. About 100 speakers will lead sessions.

For more information, call (800) 835-2246, Ext. 190.

Network managers in Georgia recently banded together to form the **Georgia Telecommunications Users Association.**

The goals of the group are to keep network managers up to date on new and revised network regulations at the state and federal level and represent the interests of members before the Georgia Public Service Commission and other regulatory bodies.

For more information, call Walt Sapronov at (404) 325-8196.



CIOs eagerly embracing open systems, survey finds

Executives also view outsourcing with caution.

By Wayne Eckerson
Senior Editor

CHICAGO — Chief information officers (CIO) are moving aggressively to implement open systems and reengineer business processes, but they have become leery of outsourcing, according to a recent survey.

Deloitte & Touche, an accounting and management consulting firm based here, polled 430 CIOs at major U.S. companies in a variety of industries. The firm's fourth annual CIO survey showed that among other management and technology trends, CIOs are pushing processing from mainframes to local-area networks but are struggling to find workers skilled in client/server computing and LAN management.

Outlook on outsourcing

Despite the volume of highly publicized outsourcing contracts signed by major U.S. firms during the past year, CIOs view outsourcing with caution, the survey found. CIOs said outsourcing nearly always fails to reduce head count and information systems (IS) expenditures or improve the quality and delivery of IS services.

"The benefits of outsourcing have fallen short of their promise in virtually every category," the survey stated.

CIOs said they are most likely to outsource isolated functions that do not have a direct tie to their corporation's competitiveness or to customer service. For most firms, that leaves disaster recovery and data entry as viable outsourcing candidates, the survey said.

On the open systems front, it seems CIOs have been quietly making plans to implement open systems (see graphic, this page). Despite the perception that the open systems movement has stalled, more than half the CIOs polled said their IS organizations are planning to adopt or are now implementing open systems.

"The benefits of outsourcing have fallen short of their promise in virtually every category."

▲▲▲

"We were astounded that CIOs were so eager to move to open systems," said Kathryn Hayley, partner at Deloitte & Touche. "Their interest in open systems is fueled by the need to cut costs and their desire to downsize to distributed computing platforms."

The survey said few companies are undertaking a wholesale replacement of proprietary systems. Rather, most are phasing in open systems when older systems need to be upgraded.

CIOs view open systems, as

(continued on page 28)

Foresight aids firm during net upgrade

Proper planning 7 years ago saved Corning lots of time, money during recent cutover to FDDI.

By Wayne Eckerson
Senior Editor

CORNING, N.Y. — A little forethought and planning seven years ago saved Corning, Inc. a bundle of money and time last month when it upgraded the speed of its campus backbone network here to 100M bit/sec.

Corning completed the upgrade to an Fiber Distributed Data Interface environment for a cost of about $100,000, without adding to or modifying its existing fiber infrastructure.

The cutover took less than an hour to complete and simply involved plugging existing fiber circuits into new FDDI transmission equipment.

"We planned ahead and put in much more fiber than we could use at the time," said Bill Ray, director of telecommunications services at Corning. "When we moved to fiber, we saw it as a 40-year investment. We didn't want to have to lay additional fiber every five years."

In 1985, Corning constructed a fiber network to connect six buildings at its headquarters here, including the computer center, engineering, research and development, and corporate offices. The fiber net supports about 3,000 terminals and personal computers linked in a campuswide Ethernet running Digital Equipment Corp.'s DECnet.

The buildings were linked using 24 multimode and single-mode fibers. The single-mode fibers, which support higher bandwidth and longer distance transmissions than multimode fibers, remained unused until recently, Ray said.

Planning ahead

Ray explained that 85% of the cost of constructing the fiber net was digging the trenches and installing the fiber, while 15% included the cost of the fiber and associated electronics.

"We realized it would be much more cost-effective to lay extra fiber during the initial construc-

(continued on page 29)

GUIDELINES

BY ROBERT ZAWACKI

E-mail: With the good points also come the bad

Electronic mail has established a well-earned reputation among corporate users for its ability to enhance communications and improve office productivity. But few companies are fully aware of the problems that E-mail can create and the steps they can take to minimize the negative impact of messaging systems.

It has been well documented in this publication and elsewhere that E-mail increases organizational productivity. E-mail facilitates scheduling meetings, reduces telephone tag, improves communications and coordination among project management teams, and allows individuals scattered across the world to cooperate on a project or provide input into a decision.

However, there has been less publicity on the potential downsides of E-mail. Companies that implement E-mail can

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Robert Zawacki is a professor of management and international business at the University of Colorado and an author of numerous books and articles on how to manage and motivate information systems professionals.

E-mail: With the good comes the bad

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quickly find themselves overloaded with junk mail or discover that employees are using the messaging system to conduct electronic garage sales and other nonbusiness activities.

The biggest hazard of E-mail is that it offers the perfect excuse for employees to avoid personal interaction with peers, business associates and customers to the detriment of the company. This is a particularly distressing problem for information systems (IS) departments, whose workers generally view social contact as a low priority.

> The biggest hazard of E-mail is that it offers the excuse for employees to avoid personal interaction with peers.
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Network and IS managers should not use E-mail as a substitute for all important face-to-face interaction with their staffs, as well as with corporate executives, managers and customers. Almost every aspect of a managers job — from motivating staff, setting goals and reviewing individual performance to working with customers in order to identify systems requirements — should be done in person.

The interpersonal skills needed to handle these elements of a manager's job often do not come easily to IS professionals. IS managers are logical thinkers who are very goal-oriented and want quick and finite solutions to problems. However, they also tend to have a low desire for meaningful interpersonal communications with other people — both on and off the job.

Given their disinterest in social interaction, many IS professionals are predisposed to hide behind E-mail. In this respect, E-mail can become a crutch that actually impedes the ability of IS professionals to grow in their jobs and contribute fully to an organization.

There are several steps companies can take to avoid the negative aspects of E-mail. First, companies should make it a priority to teach IS managers communications skills, such as how to listen to customers, provide feedback to staff, negotiate with vendors and implement changes.

Second, companies should form an advisory committee to establish guidelines on the proper use of E-mail within the firm. These guidelines should encourage employees to always consider whether it would be more appropriate to meet someone in person rather than exchange E-mail. The guidelines might also state the company's policy on whether nonbusiness communications are appropriate uses of the company's messaging system.

Finally, companies may want to consider recruiting IS professionals who exhibit good social interaction skills. While interpersonal abilities should not be the primary factor in deciding whether to hire an IS professional, social strengths should be on the list of desired qualifications.

While the benefits of E-mail far outweigh the costs, companies must implement a plan for reducing the dysfunctional consequences of E-mail. Otherwise, companies will find that E-mail does not provide enough benefits to justify its investment.

CIOs embracing open systems, survey finds

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well as distributed processing, as an important way to reduce processing costs over the long haul. CIOs said the percentage of all applications running on mainframes will decline from 68% today to 44% in two years.

Also, CIOs are moving applications off mainframes and onto LANs. Besides reducing costs, distributed processing promises to improve customer responsiveness as well as speed the development of applications.

Business reengineering — or a method of redesigning word processes to make them more efficient — has taken the executive office, including CIOs, by storm. More than 55% of all reengineering projects have been championed by a chief executive or another high-ranking corporate officer outside the CIO, according to the survey.

On average, CIOs are overseeing 1.6 reengineering projects. Most believe that cost savings from business reengineering projects will exceed original expectations.

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Foresight aids firm during net upgrade

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tion phase than to add more fiber at a later date," Ray said. "Besides, we knew users would soon be pressing us to increase the speed of the network to support new high bandwidth applications."

Two years ago, Corning began plans to upgrade the fiber network to FDDI. The move would improve performance on the network and make it capable of easily supporting high-bandwidth applications, such as imaging. In addition, it would enable Corning to replace 1.5M bit/sec Ethernet bridges with new 10M bit/sec Ethernet bridges from Fibronics International, Inc., thereby increasing throughput on the fiber network.

The existing 1.5M bit/sec Ethernet bridges were creating a bottleneck because of the growing number of users who used the backbone fiber network to access DEC's All-In-1 office automation software running on DEC VAXes housed in the campus computer center.

Most of the $100,000 Corning spent on the FDDI upgrade went toward the purchase of the Fibronics bridges, Ray said.

The FDDI network also has enabled Corning to replace 10 low-speed DECnet/Systems Network Architecture gateways with two higher speed DECnet/SNA gateways. This has reduced the number of gateways the firm must support and has improved response times for users accessing the IBM host.

Users now access the IBM host through one of two 10M bit/sec DECnet/SNA gateways in the central computer center, which are channel-attached to the host. The new gateways allow host-bound traffic to move across the backbone at full Ethernet 10M bit/sec speed instead of at 19.2K bit/sec.

Also, the FDDI network enables Corning to run distributed VAX minicomputers supporting engineering, manufacturing and systems development applications as a VAX cluster. The FDDI network allows the company to support applications requiring a virtual VAX cluster without having to physically move VAX processors to a central site.

Corning's network team installed a pilot FDDI network that ran parallel to the existing campus network. To cut over the FDDI network, the team simply unplugged the Ethernet copper cables from the 1.5M bit/sec fiber bridges and plugged them into the new FDDI bridges on the pilot net.

"Upgrading to FDDI is not that difficult," Ray said. "Other users could do this just as easily."

U.S. condemns new EC telecom directive

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ment-operated carriers favor native suppliers.

Meanwhile, overseas equipment manufacturers are leveling their own charges at the U.S., contending that the telecommunications market here is closed since AT&T buys the bulk of its carrier equipment from its own equipment units.

At a recent Center for Strategic and International Studies (CSIS) symposium here, Francois Petit, Alcatel N.V.'s director of business development, asserted that point.

Midhat Gazale, president of AT&T France, countered that the carrier's share of switches in the U.S. does not exceed 45%. He said the European PTTs not only favor their native suppliers but pay a premium for the favoritism policies because Alcatel charges France Telecom four times what it charges carriers outside of France for equipment.

Petit said Alcatel does sell its equipment to France Telecom at a higher price than what it costs on the U.S. market, though not four times higher.

The U.S. is taking exception with foreign carriers' supply practices, complaining that some countries rely on a single domestic supplier for all their telecommunications equipment without fairly considering alternatives.

This practice passes the excess equipment costs on to users in the form of higher service rates, opponents of the directive said. At the CSIS forum, Didier Thibault, a director of the Paris-based Compagnie de Suez holding company who oversees a global network, said his major problem as a France Telecom user is the high service costs charged by the carrier.

The EC directive also requires EC utilities to apply a mandatory 3% price differential in favor of EC products over non-EC goods when procuring equipment in the bid process.

Hills said the directive stipulates that its provisions must be translated into national legislation in each EC member state by July. The EC is also seeking authority to expand the discriminatory provisions beyond equipment purchases to also cover the procurement of services.

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OPINIONS

E-MAIL STANDARDS

BY JAMES BAILIE

X.400 addressing leaves much to be desired

I have the business card of a colleague who works for a long-distance carrier. The business card includes his X.400 address, which requires 57 alphanumeric symbols — 38 symbols for the actual address and 19 to define the address fields — occupying three lines of text.

This addressing scheme seems to me to be unnecessarily complex. After all, the same colleague's postal address requires only 45 symbols. And his telephone "address" — his phone number, in other words — requires 11 symbols; it is simple and easily memorized.

To ensure mass acceptance of X.400-based electronic mail systems, one of the fundamental target design specifications must be simplicity. Otherwise, it will not attract users.

> There is considerable support for both X.400 and X.500 within the industry.
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The committee that designed the X.400 addressing scheme could learn something from the Bell System. Like X.400 networks, the telephone network is extremely complex, but its original designers avoided the wrath of consumers and regulators by keeping things simple and robust. In addition, the Bell System was funded well enough that it could afford to perform extensive trials, the results of which were used in establishing the system.

No public acceptance testing of X.400

Standards committees, such as the one that designed X.400, do not have the availability of this extensive public acceptance testing. The committees are multivendor, multinational and, to a significant degree, voluntary. To make matters worse, these groups do not attract large numbers of users as members. Public acceptance testing and ergonomics have not dominated the process as did the consumers and regulators for the early Bell System.

There is considerable support for both X.400 and X.500 within the communications industry. But the target the X.400 committee should be trying to hit with development of its standard should not be just technical comprehensiveness. It should also be simplicity and mass acceptance by users.

Hundreds of software developers understand and can explain the technical issues underlying X.400 addressing. But the issue here is not technical.

Requiring users to know a 57-character address is beyond any reasonable expectation. As designed today, X.400-based E-mail will remain the domain of a small percentage of businesses and corporations that can afford MIS managers to handle the system.

In some instances, users' software can shield them from some of this addressing complexity and make it transparent.

E-mail's X.400 standard could have been made less complex while remaining equally effective. Vendors could realize a steeper revenue growth by lobbying for a redesigned and simpler X.400 standard. In fact, they would find users flocking to products based on such a standard.

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EDITORIAL

Network World institutes some changes this week

"The more things change, the more they remain the same."
— Alphonse Karr

This week's issue incorporates some design changes aimed at focusing greater attention on some major technologies shaping your networks and at making it easier to find information.

We've added two sections: Internetworks and Enterprise Applications. Internetworks focuses on the products, such as hubs, routers and bridges, used to build internetworks and on the special challenges of building and managing LAN-to-LAN and LAN-to-WAN nets.

Enterprise Applications focuses on networked applications, including distributed databases, electronic mail, groupware and client/server applications.

Covering internetworks and applications isn't new to us; in the past, *Network World* has addressed these technologies in other sections. We're simply devoting greater space and making it simpler for you to get news on these important topics.

We've also reorganized coverage of carrier services into a single section — Global Services — focusing on domestic and international voice and data services as well as regulatory issues.

In addition, we've changed the name of our Data Communications section to Data Net Architectures to better reflect the unique coverage our publication provides in that area.

Our Local Networking, Industry Update and Management Strategies sections remain. In fact, *Network World* is the only communications newsweekly with sections devoted to industry news and management trends.

All of these changes are the result of extensive research among readers, which included mail and phone surveys as well as individual interviews. We'd like to know what you think of these modifications.

And while our look has changed somewhat, our mission hasn't. Since Day One, we've aimed to be the most important source of information for enterprise network executives. Some things will never change.

OPINIONS

COMMUNICATIONS TECHNOLOGY

BY MARY JOHNSTON TURNER

Look to the banking sector for lessons in adding value

Recent changes in communications and computing technology have helped firms by making existing work processes and ways of doing business more economical or faster. But until now, technology has not changed the way businesses fundamentally operate.

During the 1990s, communications and computing technology will begin to change the fundamental basics of many businesses. Communications professionals must help their firms become agents of change rather than reactive followers if their companies are to survive.

To do this, communications managers must develop a mechanism for making business planners aware of technology changes as well as a means of translating this awareness into concrete business strategies.

Nowhere will this be more true than in banking and insurance. A look at some of the fundamental changes afoot in banking brings this home. Traditionally, banking was based on trust between an individual or business and a banker.

During the last decade, however, this relationship between bankers and clients began to break down, due in large part to technological advances such as the widespread introduction of automated teller machines, which many banking customers began using instead of human tellers. Yet the fundamental nature of the business remained the same — customers still trusted banks to manage their accounts accurately, pay interest on time and extend credit at reasonable rates.

Turner is a principal with Boston-based Northeast Consulting Resources, Inc., a consulting firm that focuses on strategic management and information technologies.

Today, nontraditional banking players — such as retailer Sears, Roebuck and Co. and common carrier AT&T (both with their own credit card) — are using networks and computing to enter the financial services business and to further erode the traditional customer/bank relationship. Operating via networks rather than person-to-person at branch banks, they introduce a new cost structure and ways of reaching customers in a highly competitive industry.

Many banking trend watchers predict that in the 1990s, banks' local branches will be replaced by fewer, more specialized money service centers, often accessed via telephone or on-line in an effort to cut costs and provide more targeted services.

When traditional delivery mechanisms, such as branch banks and long-term person-to-person banker/customer relationships, are no longer a key barrier to financial services market entry and competition, it is easy to see how new entrants, such as AT&T and Sears, with expertise in networking and credit management, can quickly move into other traditional consumer financial markets — mortgages, investment account management and even checking account services, for instance.

Tie-ins between communications and financial services could even result in new custom financial products, offered only to specific customers and based on detailed analysis of information collected to support existing products. Using information to create new services will be a critical success factor.

The commercial side of banking, particularly brokerage and financial trading, is also seeing fundamental change in the nature of its competitive structure. Traditionally, securities trading relied on two parties agreeing on the current or future value of an investment. Derivatives, or securities backed by various types of underlying investments (such as mortgages, student loans and bonds), have recently become big business as computing and communications allow rapid analysis of the variables necessary to assess risk and set pricing appropriately.

The insurance industry will see the same types of pressures since underwriting increasingly involves new types of securities backing and sales requires network-based customer access.

For the telecommunications manager, this situation is full of challenges and opportunities. Managers in traditional banking environments may find that their large ATM and branch bank nets become obsolete in favor of more flexible, higher bandwidth links to specialized service centers and global information providers. Some managers may get defensive as they see traditional measures of success — such as staff and the number of banks being managed — erode.

However, proactive telecommunications managers may find a golden opportunity to add more value to their businesses than was ever dreamed possible. Whatever your business, if it requires information access, analysis and distribution to succeed, now is the time to start building bridges to the business planners. Most business analysts, marketing managers and strategic planners in non-high-tech businesses do not fully understand the rapid changes occurring in the communications industry.

Change driven by technology is inevitable. Now the goal of communications professionals is to leverage technology into the core business strategy and to help define the new boundaries, bases of competition and success factors.

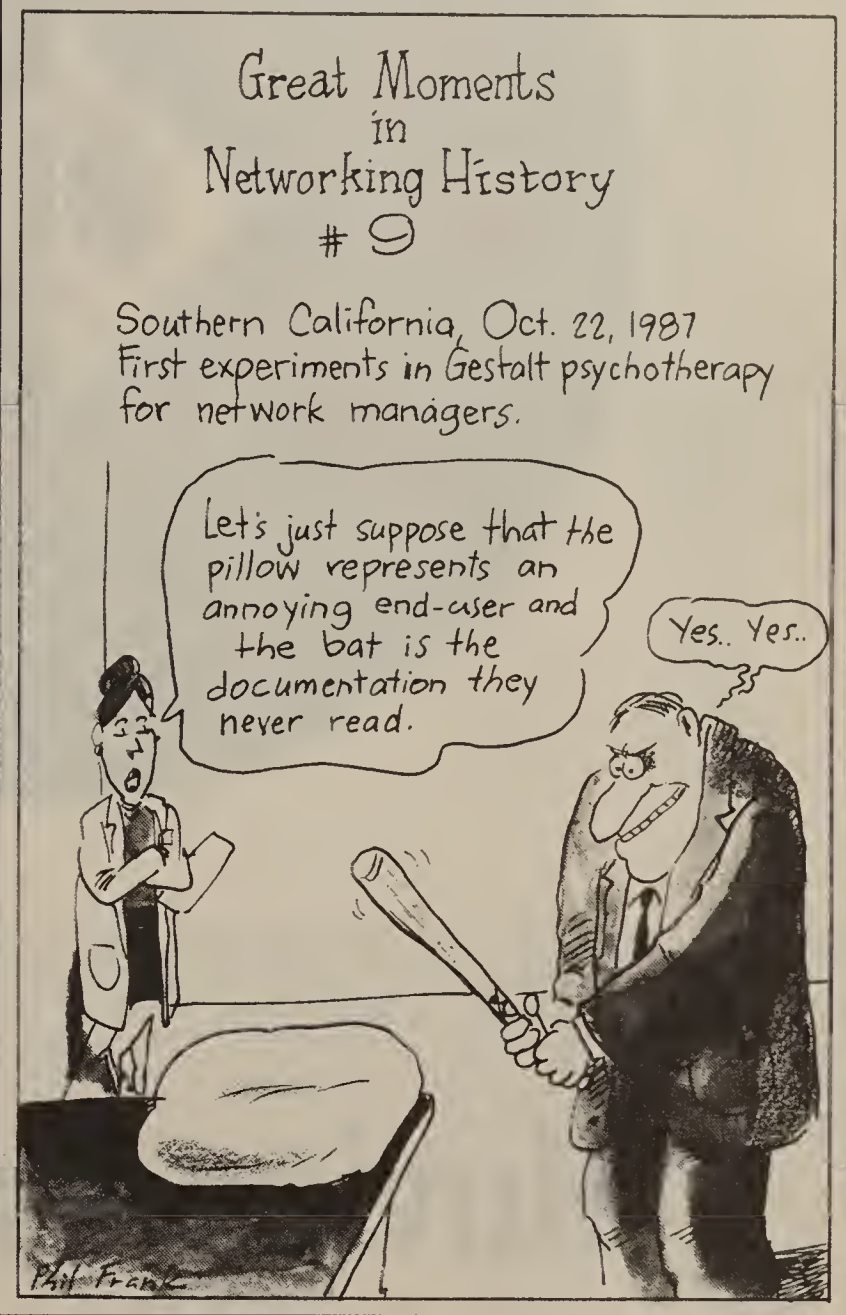
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TELETOONS

BY FRANK AND TROISE



LETTERS

Shunning gov't policy

I disagree with your recent editorial "U.S. needs comprehensive info technology policy" (*NW*, Feb. 17). The last thing the U.S. needs is a "blueprint for sustained economic growth and dominance in key industries." And surely, "a U.S. information technology industry policy" would become an albatross that would destroy our current world leadership.

All those who seek to have government mystically and suddenly get smart enough to decide what is good for all of us are wrong. The truth is that U.S. leadership today in computing, telecommunications, information services, avionics and most other branches of electronics is precisely due to the absence of the dead hand of government and the presence of entrepreneurial know-how, vision and risk taking.

Does anyone believe for a moment that Congress is capable of crafting a policy for information technology that is more enlightened than what it did for banking in 1991? Would anyone really want to trade the rich repertoire of telecommunications services available in this country for the overpriced, unreliable, limited offerings in Europe or Japan?

Is there anyone who would want to replace the vibrant science community comprising universities, corporations,

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Network World *welcomes letters from its readers.*

Letters should be typed and double-spaced. Mail them to Editor, Network World, *161 Worcester Road, Framingham, Mass. 01701.*

Letters may be edited for space and clarity.



LAN E-MAIL

Moving messages and data

CONTINUED FROM PAGE 1
program interfaces (API) are poised to unleash a flood of E-mail-enabled groupware applications. Among other uses, a mail-enabled application lets the user of a word processing package select a mail option from a menu when a message must be sent.

This obviates the need to exit the word processor and start an E-mail application in order to send a message.

Examples of potential E-mail-enabled groupware applications include group calendar synchronization that tracks the appointments of all group members, work flow automation that enables documents to be automatically passed from one user to the next as each finishes his work, and the electronic routing and approval of typical business forms such as purchase orders.

End users will soon become accustomed to an integrated desktop environment wherein access to ubiquitous electronic messaging is as easy as choosing the MAIL option on any pull-down

(continued on page 34)

Blum is a principal at Rapport Communication, an education and consulting firm in the Washington, D.C. area specializing in electronic messaging, directories and information exchange.

LAN E-mail takes on a greater role in moving messages and data across the enterprise.

CHART • GUIDE

A Buyer's Guide chart comparing LAN E-mail gateways begins on page 33, while a chart detailing LAN E-mail packages begins on page 37.

LAN E-mail gateways

Vendor	Product	Hardware requirements (for customer owned-gateways)	OS/Network OS (for customer-owned gateways)	Proprietary LAN E-mail packages supported	Gateway access method	X.400 and X.500 support	Directory or alias table facilities	Management and administration	Pricing and commercial terms
CompuServe Inc. Columbus, Ohio (614) 457-8600	CompuServe Mail Hub gateway service	None	None	MHS-compatible E-mail packages	Dial-up lines supporting messages formatted per MHS 1.5c	1984 version of X.400, including NIST profile, scheduled for 1Q, 1992	Ability to search the list of registered work groups as well as work group descriptions	Users can request work group and host definitions, as well as routing information in the CompuServe Mail Hub	MHS 1.5c upgrade available on CompuServe for $30; on-line charge based on usage: $17.80 per hour for 2,400 bit/sec link; $27.80 per hour for 9.6K bit/sec link
General Electric Information Services Rockville, Md. (800) 433-3683	LAN Connectors for accessing Quick-Comm service	PC with 640K bytes of RAM; Macintosh	DOS 3.3 or higher; Macintosh System OS/NetWare 2.X, 3.X	VINES Network Mail; cc:Mail; Quickmail; Microsoft Mail for PC Networks;Microsoft Mail for AppleTalkNetworks;3+ Mail; MHS-compatibles	9.6K bit/sec dial-up lines supporting GEIS Error Free Transfer protocol; leased X.25 line	1984 version of X.400	Base directories in LAN E-mail package; alias capability	Clients can schedule message exchange, log and track messages	$695; standard Quick-Comm message fee applys; no maintenance fee; free upgrades; 90 day trial
Infonet Services Corp. El Segundo, Calif. (310) 335-2600	Notice 400, a public X.400-based messaging service used in conjuction with Soft-Switch, Inc. Mailbridge; Retix OpenServer; OSIware, Inc. M400	See Soft-Switch and Retix entries; M400 requires PC with 2M bytes of RAM	See Soft-Switch and Retix entries; M400 MTA runs on various servers	Banyan Systems, Inc.'s VINES Network Mail; cc:Mail, Inc.'s cc:Mail; CE Software, Inc.'s QuickMail; Da Vinci Systems Corp.'s The Coordinator and eMail; Enable Software, Inc.'s Higgins Mail; Microsoft Corp.'s Microsoft Mail for PC Networks; 3Com Corp.'s 3+Mail; WordPerfect Corp.'s WordPerfect Office	Mailbridge, OpenServer and M400 link LAN E-mail package to Notice 400	1984 version of X.400, including NIST, GOSIP and EWOS profiles; 1988 version of X.400 planned for 4Q, 1992; X.500 planned for 1993	See Soft-Switch and Retix entries; M400 includes an integrated alias table and directory facility	Infonet Network Control and Support Center provides installation support, trace, logging and monitoring 24 hours a day, 7 days a week	See Soft-Switch and Retix entries; M400 can be leased for $125,000 and $300,000; hourly Notice 400 charges are between $8.50 and $26 per hour plus four cents to 30 cents per thousand characters
Joiner Software, Inc. Madison, Wis. (608) 238-4454	JMail-MHS Version 1.2; Complementary products: JMail-MHS-SPX Version 1.0; works in conjunction with Digital Equipment Corp. VAX Message Router server	PCs with 512K bytes RAM; most VAXes	DOS Version 3.0 or higher/Novell, Inc. NetWare DOS shell Version 2.1 or higher; VAX/VMS Version 5 or higher	cc:Mail; The Coordinator, eMail; Digital Equipment Corp.'s All-In-1 Mail; Microsoft Mail for PC Networks; WordPerfect Office	NetWare or DEC Pathworks file-sharing mechanisms or Ethernet links supporting JMail-MHS-SPX are used to access DEC Message Router/X	1984 version of X.400 Access supplied by DEC Message Router/X; 1988 version of X.400 gateway and address mapping scheduled by Joiner for release this year	Supports address lookups in DEC's Distributed Directory Service; address mappings in JMail-MHS gateway	JMail-MHS and JMail-MHS-SPX provide full logging of all messages sent and received, as well as error reporting	JMail-MHS: $9,800; JMail-MHS-SPX: $1,000; media and documentation: $450; service and support: $1,800; 30 day free trial period with service
MCI Communications Corp. Washington, D.C. (800) 444-6245	MCI Mail; gateways providing access to MCI Mail: V-Bridge for VINES Network Mail; M-Bridge for MHS-compatible packages; cc:Mail Link to MCI Mail; CommGATE for E-mail packages running on Apple Computer, Inc.'s AppleTalk; Microsoft Mail Gateway to MCI Mail; WordPerfect Connections for WordPerfect Office	V-Bridge requires at least a 80386-based PC file server; M-Bridge, cc:Mail Link to MCI Mail, Microsoft Mail Gateway to MCI Mail and WordPerfect Connections run on any PC with 640K bytes of RAM; CommGATE runs on Apple Macintosh Plus or higher with 4M bytes of RAM; M-Bridge also requires MHS; Microsoft Mail Gateway to MCI Mail requires Microsoft gateway communications server	DOS; Comm GATE requires Macintosh System 6.03 or higher/V-Bridge requires VINES 4.0 or higher; M-bridge requires NetWare; CommGATE rquires AppleTalk	VINES Network Mail, Beyond, Inc.'s BeyondMail, cc:Mail, Higgins Mail, Futurus Corp.'s Right Hand Man, Lotus Development Corp.'s Lotus Notes, Microsoft Mail for PC Networks, Notework Corp.'s Notework, WordPerfect Office, other MHS-compatible packages	LAN-based gateways connect to MCI Mail via dial-up 800 service and interact with MCI Mail via the service's proprietary Message Exchange Protocol II	1984 version of X.400, including NIST, and portions of GOSIP supported; 1988 version of X.400 and X.500 planned	Supported through each LAN E-mail package not in the gateway to MCI Mail; LAN E-mail package user can request an MCI Off Net Registrant account on MCI Mail that will display an individual directory listing on the MCI Mail service	Gateways to MCI Mail provide the ability to grant user access rights and view logs of message traffic; user name and password are required for log on	V-Bridge: 10 clients, $1,495; 20 clients, $2,795; unlimited clients, $4,995; M-Bridge: 10 clients, $495; unlimited clients; $1,495; cc:Mail Link to MCI Mail: $1,295; CommGATE: $595; Microsoft Mail Gateway to MCI Mail: $995; Microsoft Mail Gateway Access to MCI Mail: $495; WordPerfect Connections Gateway for MCI Mail: $495
Microsoft Corp. Redmond, Wash. (206) 882-8080	Microsoft Mail Gateway to X.400 an X.400 MTA and Access component	At least a 80286-based PC AT with 640K bytes of RAM	DOS 3.1 or higher/any LAN OS providing file sharing, including Microsoft's LAN Manager, IBM's LAN Server, NetWare, VINES	Microsoft Mail for PC Networks; MHS-compatible LAN E-mail packages can be linked to Microsoft Mail for PC Networks and X.400; other LAN E-mail packages can be interconnected to Microsoft Mail for PC Networks via IBM's SNADS, IBM's Professional Office System or SMTP	LAN E-mail package communicates with MTA using X.400's Access component and shared file system	1984 version of X.400, including NIST and GOSIP	Any gateway addressee can be assigned Microsoft Mail for PC Networks alias by user or administrator and placed in personal, group or distribution lists; for incoming mail, the gateway supports advanced user-to-user name mapping	Fully integrated with Microsoft Mail administration facilities	$4,995, Access component additional
NCR Corp. Dayton, Ohio (513) 445-5000	NCR X.400; NCR OSI/Internet Gateway; AT&T Easylink Gateway planned	Server: NCR System 3000 with 8M bytes of RAM and 200M bytes of disk storage; client: PC and NCR System 3000 with 640K bytes of RAM	Server: Unix System V.4; client: DOS/Sun Microsystems, Inc. NFS; LAN Manager; Portable NetWare support planned	Unix E-mail packages supported through NCR OSI/Internet Gateway	LAN gateway submits messages to NCR X.400 MTA via shared file system	1984 version of X.400 and NIST; 1988 version of X.400 planned for 1993; X.500 Central Director available as separate product	Private, local and central directory levels based on separate X.500 product	Form-based administration and configuration; default quick configuration available; on-line help and function keys; error and event logs	Ranges from $800 to $25,000, depending on which model of NCR System 3000 is used and the number of users

EWOS = European Workshop for Open Systems
GOSIP = Government Open Systems Interconnection Profile
MHS = Message Handling System
MTA = Message Transfer Agent
NFS = Network File System
NIST = National Institute of Standards and Technology
SNADS = IBM Systems Network Architecture Distribution Services
SMTP = Simple Mail Transfer Protocol

This chart includes a representative selection of LAN E-mail gateways. These vendors may offer other equipment, and other vendors not included may offer a full range of products.

SOURCE: RAPPORT COMMUNICATION, TAKOMA PARK, MD., AND WASHINGTON, D.C.

(continued from page 32)
menu. Small to midsize users just formulating their future messaging strategy can start by selecting which of several dozen feature-rich products can support internal use and rely on public E-mail services for external communications.

Larger users, however, face the challenge of integrating LAN E-mail packages with host-based and other internal E-mail packages using backbones based on the CCITT/ISO X.400 or other de facto standards. These users are also changing their focus from acquiring single-server LAN E-mail packages to multiple server packages.

"Whereas in the past it was common to get orders from users for a single-server network, now we're getting a lot of orders from users deploying LAN E-mail internets of 25 servers or more," says Alex Cullen, a product manager at Westborough, Mass.-based Banyan Systems, Inc.

In order to satisfy the needs of large users, many vendors now offer server-to-server directory synchronization, cross-server management/monitoring and expanded installation/maintenance support.

Because today's users are evaluating how well LAN E-mail packages will interoperate with host-based, Unix and even public mail services — such as MCI Communications Corp.'s MCI Mail or US Sprint Communications Co.'s SprintMail — vendors must offer the necessary gateways to X.400-based public or enterprise mail backbones. Vendors must also support access to messaging backbones that use de facto standard protocols, such as the Transmission Control Protocol/Internet Protocol's Simple Mail Transfer Protocol (SMTP) and Novell, Inc.'s Message Handling Service (MHS).

The chart starting on page 33 lists LAN gateway products and services from providers that support CCITT/ISO X.400 interworking.

The chart starting on page 37 lists a number of front-end LAN E-mail software products running user interfaces on the desktop. One or two products from this list may represent a complete messaging solution for small to midsize users.

However, users with heterogeneous messaging networks need to consider gateways as well as front ends in order to obtain enterprisewide interoperability between both LAN and host-based E-mail packages. (For more information on how front-end and gateway products work, see "Scaling the enterprise backbone with LAN E-mail," page 38.)

Buying an E-mail front end

LAN E-mail is expected to be the hottest segment of the messaging market in the 1990s. Studies conducted last year by International Data Corp., a Framingham, Mass.-based market research firm, indicate that the aggregate U.S. LAN E-mail box population will grow from about four million in 1990 to 37 million by 1995.

> LAN E-mail box population will grow from four million in 1990 to 37 million by 1995.
>
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As the use of LAN E-mail grows, it becomes more important for users to select the package that is right for them. By knowing a particular package's hardware requirements and the operating systems and net operating systems it supports, users can identify which products are inherently suitable or unsuitable.

For example, if a network consists primarily of aging IBM Personal Computer XTs or ATs with severe memory constraints, users may want a package like Notework Corp.'s Notework, which supports a 5K-byte terminate-and-stay resident (TSR) interface. On the other hand, users with networks supporting Microsoft Corp. Windows-based PCs and Apple Computer, Inc. Macintoshes should investigate products such as Banyan's VINES Network Mail, cc:Mail, Inc.'s (a division of Lotus Development Corp.) cc:Mail, Da Vinci Systems Corp.'s eMail and Microsoft's Microsoft Mail for PC Networks.

Users should also keep abreast of changes in the number of vendors in the E-mail market because several firms have recently been acquired and a lot of new entrants are emerging (see "New vendor lineup emerging," page 47).

Almost all LAN E-mail products are based on the client/server paradigm, where the client resides in the user's desktop PC or Macintosh and provides the front-end interface, while the server provides mail storage, directory listings and inter- and intra-LAN transport.

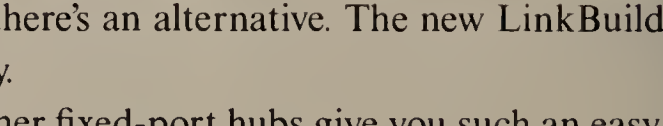
As messaging grows more complex, however, LAN E-mail vendors have distributed functions that typically resided in a single server across multiple servers. For example, servers from cc:Mail and most other LAN E-mail packages provide proprietary transport within their own E-mail networks but rely on separate X.400 gateway or MHS servers for interoperable transport.

Similarly, clients are becoming decoupled from servers in the sense that the same vendor may not provide both halves of the client/server equation. In its MailMAN product, Reach Software Corp. provides an open client that works with VINES or MHS, while InTouch Software, Ltd.'s Personal Mail works with IBM's Professional Office System (PROFS). Both Enterprise Solu-



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LinkBuilder 10BT hubs are fixed-port hubs, but they act like chassis-based, modular hubs. You add ports as you need ports. You manage as you need to manage. You grow as you need to grow.

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Best of all, perhaps, you can turn an unmanaged stack of LinkBuilder 10BTs into a managed stack with astonishing ease.

tions, Ltd. and OCP International, Ltd. provide clients that work with Retix's X.400 OpenServer product.

User interface features also will be high on potential buyers' checklists. The LAN E-mail packages chart indicates whether a particular product provides a character-oriented menu style interface (typical in a DOS environment) or a graphical user interface (standard in Windows or Macintosh products).

Many DOS products also provide TSR software that notifies users of newly arrived messages and enables them to quickly generate E-mail notes without leaving their active application.

Another important feature is the ability for users to store mail in message folders. Usually the E-mail package provides some type of folder, such as an in-basket, but many packages allow users to create their own folders. Products such as Da Vinci's eMail, Microsoft's Microsoft Mail for PC Networks, and Hewlett-Packard Co.'s NewWave Mail allow users to create hierarchical folders, which are folders stored within folders.

Virtually all LAN E-mail front-end products allow arbitrary binary or text information to be attached to a message. However, only some provide a built-in capability, called a viewer, to display the semantic content of non-textual message attachments.

Usually only Windows, Macintosh or OS/2 implementations provide application launching, wherein, for example, a user might activate a spreadsheet program by selecting an icon representing a spreadsheet message enclosure. Products, such as CE Software, Inc.'s Quickmail and Futurus Corp.'s Right Hand Man II, now called Futurus Team, allow voice to be included in a message and played by the recipient.

Some Windows-based products support Microsoft's Dynamic Data Exchange (DDE), which can be helpful in generating ad hoc work flow applications. For example, an automated status report could consist of a short heading and a spreadsheet attachment. DDE could be used to link the spreadsheet attachment to a spreadsheet file containing weekly sales figures. Once a week, DDE would be used to retrieve the spreadsheet containing the most recent sales figures and attach it to an E-mail message, which is distributed to a list of recipients in the organization.

In general, the more DDE and other technologies are used to integrate E-mail with the surrounding desktop environment, the better. For example, Futurus Team includes group scheduling, calculators and interactive computer chatting software, which enables end users to converse using their keyboards. Interactive chatting is a scaled-down version of a computer conference in which multiple parties are able to simultaneously view and edit the same document.

> "What's wrong with E-mail is there aren't enough applications off the shelf."
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Enable Software, Inc.'s Higgins Mail is bundled with groupware and adds general-purpose database functionality in addition to store-and-forward messaging.

Other LAN E-mail packages concentrate heavily on internal utilities to reduce junk mail build-up through automatic filtering. For example, automatic action utilities allow users to program a LAN E-mail box to automaticlly respond to certain categories of incoming messages, automatically forward certain messages to other users and automatically put mail in folders.

Beyond, Inc.'s BeyondMail has turned the art of automatic actions into a science with the aid of a rules-based interface that's so sophisticated that one analyst jokes, "If you hooked up ELIZA [a well-known computer conversational program written at the Massachusetts Institute of Technology] to a BeyondMail mailbox, you could go on vacation for three months and nobody would know you'd left the company."

However, some users would like E-mail to do even more.

"LAN E-mail works exactly as advertised, and it works pretty well," says E. Brian Cary, director of technical support for the American Bar Association (ABA) in Chicago. "What's wrong with E-mail is there aren't enough applications off the shelf. We've got a couple of locations in the ABA where information needs to be rolled up through several departments. Vendors really ought to be soliciting information from users about their business applications as well as about their basic E-mail needs."

Some vendors are addressing a major user concern. They have started including facilities such as X.400 that will eventually enable disparate E-mail packages to communicate. The user interface and gateway columns in the LAN E-mail packages chart indicate whether a product provides native X.400 support for all mandatory and some optional X.400 message header fields as well as X.400 addressing.

Most LAN E-mail implementations do not claim to provide native X.400, although they generally will store X.400 addresses in their directories and support X.400 indirectly through a gateway. However, many users find that messages routed through gateways become cumbersome, containing great volumes of un-

(continued on page 36)

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LAN E-mail gateways

Vendor	Product	Hardware requirements (for customer owned-gateways)	OS/Network OS (for customer-owned gateways)	Proprietary LAN E-mail packages supported	Gateway access method	X.400 and X.500 support	Directory or alias table facilities	Management and administration	Pricing and commercial terms
Retix Santa Monica, Calif. (310) 828-3400	OpenServer 400; SMTP Gateway to X.400; MHS to X.400 Gateway; cc:Mail Gateway to X.400; Microsoft Mail for Macintosh Gateway to X.400; Microsoft Mail for PC Networks Gateway to X.400	OpenServer: 80386-based PC with 640K bytes of RAM, enhanced graphics adapter or video graphics adapter; client: PC XT or higher with hard disk; Macintosh SE or Macintosh II with 3M bytes of hard disk; 640K bytes of RAM required for DOS Gateways; 4M bytes of RAM for SMTP or Macintosh gateways	OpenServer: DOS 3.1 or higher; The Santa Cruz Operation, Inc.'s Unix V.3; Interactive Systems Corp.'sUnix client: DOS 3.1 or higher; SCO or Interactive Unix; Macintosh System 6.0.2 with Multifinder Version 6.1	BeyondMail; cc:Mail; Quickmail; eMail; Higgins Mail; Hewlett-Packard Co.'s OpenMail; Microsoft Mail for PC Networks; Oracle Corp.'s Oracle*Mail; WordPerfect Office; MHS-compatible packages; SMTP-compatible packages	Retix develops gateway software to run in LAN client; gateway software submits messages to OpenServer via shared file system	1984 version of X.400 including NIST and EWOS; 1988 version of X.400 and X.500 planned for 1992	Alias tables perform address mapping between LAN E-mail packages and X.400	Microsoft Windows 3.0 configuration interface on OpenServer; message delivery and nondelivery reports; message priority; autoforwarding and logs in LAN client gateways	OpenServer 400 for DOS: $5,495; OpenServer 400 for Unix: $5,495; gateways $1,795 each
Soft-Switch, Inc. Wayne, Pa. (215) 640-9600	SNADS Gateway/cc:Mail; SNADS Gateway/Microsoft Mail for PC Networks; SNADS Gateway/VINES Network Mail; SNADS Gateway/ Higgins; SNADS Gateway/3Com	80286-based PC with 640K bytes of RAM and 10M bytes of disk storage	DOS 4.1/NetWare; AT&T Starlan; Ungermann-Bass, Inc. NetOne; VINES; IBM PC LAN; 3Com Corp. 3+; AST Research, Inc. Resource Sharing Network	cc:Mail; Microsoft Mail for PC Networks; VINES Network Mail; Higgins Mail; 3Com Corp.'s 3+ Open; 3+ Share	LAN operating system used to access gateway; SNADS used to link gateway to IBM mainframe-based Soft-Switch Central, which interconnects over 50 E-mail packages	1984 version of X.400 including NIST profile provided via optional Soft-Switch X.400 gateway, which runs on a PC attached to host running Soft-Switch Central; SMTP supplied by Soft-Switch Central; 1988 version of X.400 scheduled for 2Q, 1992	Address mapping and autoregistration; synchronizes automatically with cc:Mail; synchronization with Lotus Notes and VINES Network Mail planned; Soft-Switch D/S; Retix DX planned; IBM Shadowing Protocol and X.500 scheduled for 1993	Mail Monitor package automatically monitors availability of gateways and gateway attahced E-mail packages	Gateway licenses start at $4,995 with finial pricing depending upon network size; Soft-Switch Central: $15,000; X.400 Gateway Model 10: $35,000; X.400 Gateway Model 20: $60,000; Mail Monitor: $40,000; annual relicensing and maintenance is 20% of initial license fee
	SNADS Gateway/Microsoft Mail for AppleTalk Networks	Macintosh IIx or IIcx with 4M bytes of RAM and 10M bytes of disk storage	Macintosh System 6.07 and Multifinder 6.1.7	Microsoft Mail for AppleTalk Networks	AppleTalk used to access gateway; SNADS used to link gateway to Soft-Switch Central	Same as above	Same as above	Same as above	Same as above
	Lotus Notes Gateway	Runs on Notes server	Runs on Notes server	Lotus Notes	IBM's LU 6.2 used to link gateway to Soft-Switch Central	Same as above	Same as above	Same as above	Same as above
	NetWare MHS Gateway	80386sx-based PC with 3M bytes of RAM and 40M bytes of disk storage	DOS/NetWare	The Coordinator; eMail; Wordperfect Office; Right Hand Man; BeyondMail; Quickmail	SNADS used to access Soft-Switch Central	Same as above	Same as above	Same as above	Same as above
US Sprint Communications Co. Lenexa, Kan. (800) 736-1130	Sprint Message Xchange for LANs and SprintMail: Public messaging services	None	None	cc:Mail; MHS-compatible packages planned	LAN E-mail packages communicate with SprintMail over dial-up lines using their native protocol	1984 version of X.400, including NIST; GOSIP planned for 1993; 1988 version of X.400 support planned for 1992	X.400-to-cc:Mail address conversion using rules-based aliasing	Continuous monitoring; detailed per message accounting	Initial registration fee of $500; standard SprintMail X.400 message rates
Worldtalk Corp. (1) Campbell, Calif. (408) 374-2500	Worldtalk 400 for 386/ix; Worldtalk 400 for HP 9000; Worldtalk 400 for SMTP; Worldtalk 400 for cc:Mail; Worldtalk 400 for Lotus Notes; Worldtalk 400 for MHS; Worldtalk 400 for Microsoft Mail; Worldtalk 400 for QuickMail	Server: 80386-based PC with 8M bytes of RAM; HP 9000; clients: require no additional hardware	Server: Interactive Unix 2.2.1 or higher; HP UX 8.0; gateways: DOS; Unix; OS/2; Macintosh System OS/NetWare; LAN Manager; Sun NFS	cc:Mail; QuickMail; The Coordinator; eMail; Lotus Notes; Microsoft Mail for PC Networks; MHS- and Unix-compatible packages	Direct Ethernet connection using Worldtalk remote procedure call; File-based gateway to server connectivity using Worldtalk OSI protocols or via shared NFS	1984 version of X.400, including NIST, GOSIP and EWOS	Integrated alias manager maps X.400 addresses to local format upon sending and receiving by combining administrator-defined rules with database lookup; future version will synchronize alias database with local E-mail directories	Includes facility to configure and manage server and gateways; remote dial-in capability for diagnosing system or configuration problems; log files for server and each gateway	Worldtalk MTA and Gateway Engine distribution kit: $5,000; distribution kit for all other Worldtalk 400 gateways: $295 each; 100-client license: $4,900; additional 100 clients: $1,900

EWOS = European Workshop for Open Systems
GOSIP = Government Open Systems Interconnection Profile
MHS = Message Handling System
MTA = Message Transfer Agent
NFS = Network File System
NIST = National Institute of Standards and Technology
SNADS = IBM Systems Network Architecture Distribution Services
SMTP = Simple Mail Transfer Protocol

FOOTNOTE:
(1) Formerly Touch Communications, Inc.

This chart includes a representative selection of LAN E-mail gateways. These vendors may offer other equipment, and other vendors not included may offer a full range of products

SOURCE: RAPPORT COMMUNICATION, TAKOMA PARK, MD., AND WASHINGTON, D.C.

(continued from page 35)
interesting trace information.

The problem with gateways

Gateways become particularly problematic in complicated message exchanges. "E-mail is a cooperative application," says Einar Stefferud, president of Network Management Associates, Inc. of Long Beach, Calif. "Messages are not packets going through multiprotocol routers like ships in the night. They are going between real users.

"You run into intractable problems when you have three or more users sending, forwarding, replying to and receiving notifications about messages between dissimilar mail packages with different message header fields, different message semantics and different ways of returning acknowledgments. I call this the 'three-body' problem," he says.

Native X.400 products have the advantage of shared message format and message service definition. Of the vendors without native X.400 listed in the LAN E-mail packages chart, only Banyan has any commitment to move toward native X.400. In fact, due to problems with early native X.400 efforts, many vendors and users believe native X.400 user interfaces are too complex or use too much memory.

However, user-friendly, memory-efficient native X.400 user interfaces can be implemented.

Native X.400 vendors include Alfalfa Software, Inc., Digital Equipment Corp., Enterprise Solutions, Frontier Technologies Corp., HP and OCP International.

Many of these vendors are new entrants and some of their imple-

(continued on page 39)

LAN E-mail packages

Vendor	Product	Hardware requirements	Operating System/Network operating system	User interface/ Attachments/ Multimedia features	Gateway/API interfaces	Fax support	Utilities and mail-enabled applications	Local and enterprise directory facilities	Mail system management and security	Pricing and commercial terms
Alfalfa Software, Inc. Cambridge, Mass. (617) 497-2922	Poste 2.0	Client and server: 80386- and 80486-based PC, as well as various Unix-based workstations	Various Unix versions; DOS release planned 2Q, 1992/TCP/IP	GUI; terminal emulation via command line interface; nested folder hierarchy/Text and binary files/ Application launching; voice embedding	Native X.400 UA supporting 1984 version of X.400; X.400-to-MHS; X.400-to-SMTP; SMTP-to-MHS gateways; 1988 version of X.400 planned for this year/XAPIA's Gateway API; API to SMTP; command-based scripting language	Inbound and outbound; addressing support in alias and distribution lists	Only mail-related utilities; command-based scripting language can be used to provide mail filtering, filing and other mail-enabled application capabilities	Name search facility; X.400 addresses and mixed lists; LAN-wide directory for global aliases and distribution lists, along with tools to interface to other directories	Uses account management, monitoring, audit, and logon facilities built into Unix;error logging and message password protection	Poste 2.0: single client, $395; 5 clients, $1,750; 10 clients, $2,950; 25 clients, $5,950; optional client-based Poste/X.400 Gateway, $1,500; concurrent, floating licensing; 30 days free support; 90-day warranty; 30-day evaluation
Banyan Systems, Inc. Westborough, Mass. (800) 828-2404	VINES Network Mail	Client: any PC with 512K bytes of RAM, Apple Computer, Inc. Macintosh SE or higher with 2M bytes of RAM; server: any Banyan-certified PC with 4M bytes of RAM	Client: DOS 3.0 or higher, OS/2 1.1 or higher, Macintosh System 6.0.7 or higher/Any current version of Banyan ViNES	Character-oriented menu interface, TSR mail alerts for DOS/Text and binary files/ Multimedia products may be provided by third parties	MHS and X.400 gateways available from third-party vendors; product will evolve toward feature- and function-compatibility with X.400; SMTP gateway from Banyan/ Directory, storage, transport, management APIs provided for gateways, mail-enabled applications, and third-party mail clients	Inbound and outbound support from third parties	VINES Chat utility; integrated phone message and calendaring utilities from third parties; mail and directory; third-party products being developed for message filtering, automatic actions, work flow, and electronic forms	Name search for recipients and distribution lists is integrated with Banyan's StreetTalk network directory service; searches by names, nicknames and lists; user-selectable fields may be added; automatic synchronization with Banyan networks and Soft-Switch, Inc.'s D/S; Retix's DX support planned; X.500 demonstrated and planned	Mail management is integrated with VINES Network Management; automates most mailbox, mail service, routing, directory and security functions; management privileges controlled from Access Rights List; messages stored in secure file area accessible to recipient only	$995 per server with unlimited clients; VINES Network Mail needs only be installed on a subset of servers in a network; maintenance included with VINES maintenance agreement; 90-day warranty
Beyond, Inc. Cambridge, Mass. (800) 845-8511	BeyondMail Version 1.1	Client: 80286-based PC or higher with 1M byte of RAM; server: 80286-based PC or higher with 3.5M bytes of disk storage	Client and server: DOS 3.1 or higher/NetWare 2.1X, 2.2, 3.X; IBM PC LAN Version 1.3; 3Com Corp. 3+Share; VINES 3.0 or higher; Microsoft Corp. LAN Manager 2.0	Character-oriented menus interface to mail; rules-based interface for constructing mail-enabled applications; TSR/Text and binary files/ Application launching from DOS; voice embedding and playback	Native MHS implementation; X.400 to MHS gateway certified by Retix and others; SMTP to MHS gateways possible/Novell, Inc. SMF for MHS API	Inbound and outbound supplied by MHS	Packaged with forms for meetings, phone message, request, transmittal, memo, customer support; can create custom forms; intelligent filtering, forwarding, reply, message creation; reminder system	Advanced name search includes comments field search and soundex phonetic search algorithm; stores X.400 O/R addresses, mixed lists; automatic synchronization between BeyondMail servers, cc:Mail, Inc. cc:Mail, DaVinci Systems Corp. and Microsoft Mail for PC Networks; Soft*Switch D/S; Retix DX	Rules-based mail capability supports monitoring, archiving and alerting; file-server security; message password protection; message encryption	Starter Pack with 10-node license: $995; 5-Node Expansion Pack, $495; 20 Node Expansion Pack: $1,695; Remote Access Edition: $295; Forms Designer: $395; free customer support to registered users; CompuServe Forum (type GO BEYOND to access Forum); 90-day warranty
cc:Mail, Inc. (a division of Lotus Development Corp.) Mountain View, Calif. (800) 448-2500	cc:Mail MS DOS Platform Pack Version 3.2; cc:Mail Windows Platform Pack Version 1.1; cc:Mail Macintosh Platform Pack Version 1.2; cc:Mail OS/2 Platform Pack Version 3.2	DOS-based PC with 512K bytes of RAM; Microsoft Corp. Windows-based PC with 2M bytes of RAM; OS/2-based PC with 2M bytes of RAM; Macintosh with 1M byte of RAM	DOS 3.3 or higher; Windows 3.0, Macintosh System 6.03 or higher; OS/2 1.1 or higher/ NetWare 2.XX, 3.XX; LAN Manager; 3Com; VINES; Sitka Corp. TOPS; any server supporting DOS 3.1 file and record-locking or Apple AFP	Character- or menu-based interface with TSR for DOS; graphical for Windows, OS/2 and Macintosh/Text and binary/Application launching and DDE with Windows; message folders	cc:Mail gateway to X.400 comarketed with Retix; other X.400 gateways available from third parties including Worldtalk Corp., Soft-Switch; MHS; SMTP/Supports Lotus OMI and cc:Mail Import/ Export APIs	Inbound and outbound support provided by cc:Fax and cc:Faxview	cc:Mail provides links to cc:Mail Network Scheduler II	Location, name and comment fields; hot-key search on name and comments; X.400 O/R addresses and mixed lists stored; cc:Mail Automatic Directory Exchange product supports synchronization between cc:Mail servers; multivendor synchronization with DEC's DDS, Soft-Switch D/S; Retix DX planned	Management utility program supports self-diagnostics, database statistics and administration reports; gateway batch logs; multiple server monitoring; remote logon; automated account management; messages encrypted between servers and can be password-protected	Server-based DOS Platform Pack Version 3.2, $195; Windows Platform Pack Version 1.1, $495; Macintosh Platform Pack Version 1.2, $495; OS/2 Platform Pack Version 3.2, $495; 8 client pack Version 3.2, $195; 25-client pack Version 3.2, $595; cc:FaxView Version 1.2, $995; Network Scheduler II, $595; 20-client pack, $395; cc:Mail Gateway, $1,295; cc:Mail Remote, $295; cc:Mail Automatic Dir Exchange, $995; cc:Fax, $1,995; free demo disk with working copy

AFP = Apple File Protocol
API = Application Program Interface
CMS = Computer Mail Services, Inc.
DDE = Dynamic Data Exchange
DDS = Distributed Directory Service
D/S = Directory Synchronize
DX = Directory Excahnge
GUI = Graphical user interface
MAPI = Messaging Application Program Interface
MHS = Message Handling Service
MTA = Message tranfer agent
OLE = Object Linking and Embedding
OMI = Open Messaging Interface
O/R = Originator/requestor
PROFS= Professional Office System
RAM = Random-access memory
SMF = Simple Message Format
SMTP = Simple Mail Transfer Protocol
TSR = Terminate and stay resident
TTY = Teletypewriter terminal
UA = User Agent
UUCP = Unix to Unix Copy Program
XAPIA = X.400 Application Program Interface Association

This chart includes a representative selection of LAN E-mail packages. These vendors may offer other packages, and other vendors not included may offer a full range of products.

SOURCE: RAPPORT COMMUNICATION, TAKOMA PARK, MD. AND WASHINGTON D.C.

Scaling the enterprise backbone with LAN E-mail

Local-area network electronic mail packages can offer a messaging solution for one or more departments in an enterprise. But how well can those packages scale up to other levels in the enterprise? To be useful in companies implementing a multilevel messaging strategy, a LAN E-mail package must be able to interact with other E-mail packages in the company as well as the packages used by its trading partners.

LAN E-mail packages provide messaging at the departmental messaging level (see graphic, this page). Since most large companies have two or more LAN E-mail and host-based messaging packages, gateways into an enterprise messaging backbone are required to provide interoperability at the enterprise backbone level.

Point-to-point gateways (not shown in graphic) are often a viable solution for exchanging messages between disparate LAN E-mail packages in different departments of small or midsize companies. But this messaging strategy works well only if the company uses just a few different LAN E-mail packages, with several offering point-to-point gateways.

Large companies that must interconnect heterogeneous E-mail systems should avoid point-to-point gateways. Instead, they should direct gateway traffic into a high-capacity backbone managed by full-time staff who have the resources to resolve problems.

> MHS often acts as a backbone or hub protocol.
>
> ▲▲▲

The concept of an enterprise backbone — depicted in the graphic — shows how users of Red Mail and Blue Mail can communicate by sending messages into the backbone.

Backbone access can be obtained through gateways or, in some cases, protocols, such as Novell, Inc.'s Message Handling Service (MHS), built into LAN E-mail packages. Where needed, gateways are sometimes implemented as protocol translation code in a LAN E-mail server or translation code in a backbone message switch or intermediate messaging server.

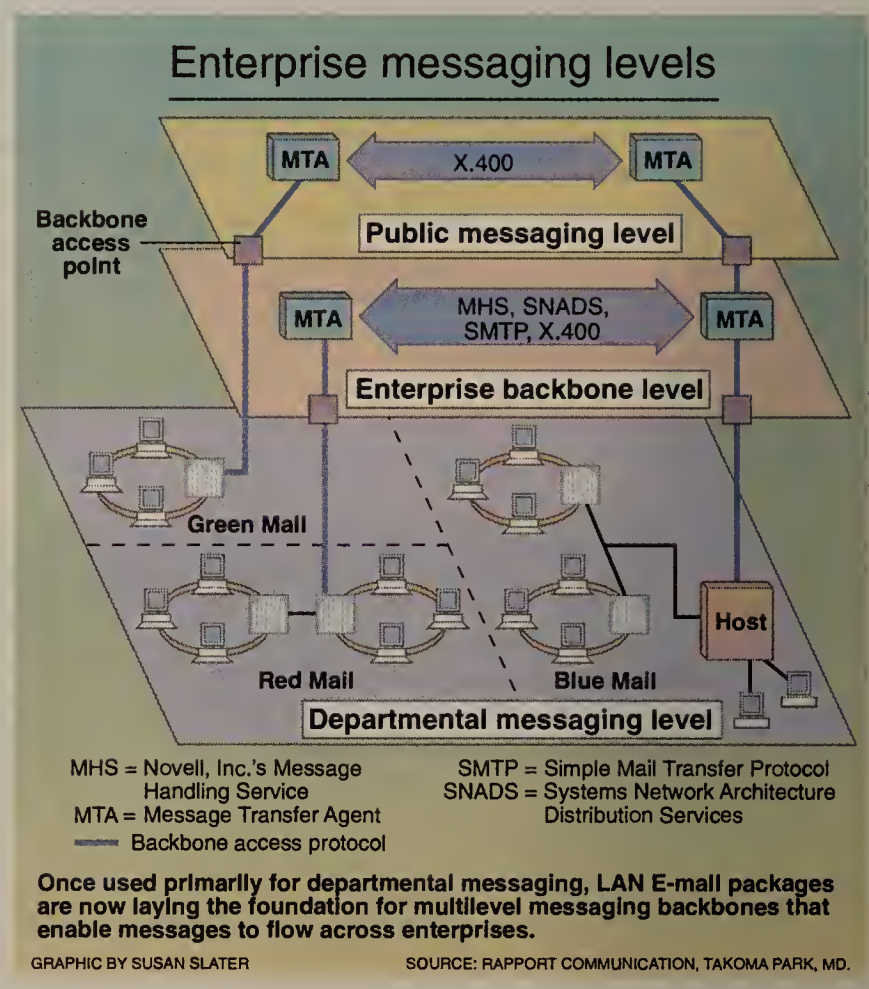
Usually, a single messaging protocol is used on the backbone. For example, MHS often acts as a backbone or hub protocol in LAN environments that use DOS exclusively. Likewise, the Transmission Control Protocol/Internet Protocol's Simple Mail Transfer Protocol (SMTP) is used within Unix communities, and IBM's Systems Network Architecture Distribution Services is used within IBM environments.

ISO X.400 backbones

However, companies are increasingly deploying or considering deployment of International Standards Organization X.400 backbones to ensure any-to-any interoperability in the future.

Interenterprise E-mail is also important for users to consider. Here, users have a choice between connecting directly to trading partners or through a public messaging network, such as US Sprint Communications Co.'s SprintMail or MCI Communications Corp.'s MCI Mail.

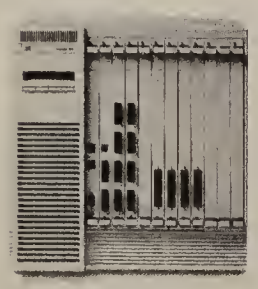
When the number of direct interconnections exceeds what a user can reasonably manage, the routing and management capabilities of public services become attractive.



Once used primarily for departmental messaging, LAN E-mail packages are now laying the foundation for multilevel messaging backbones that enable messages to flow across enterprises.

GRAPHIC BY SUSAN SLATER SOURCE: RAPPORT COMMUNICATION, TAKOMA PARK, MD.

Distributing bandwidth on the netw



Link Builder 3GH hub

"Me! Me! Me!"

Every day the shrill cries of users hungry for more bandwidth clamor in your ears.

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Now you can put any network-hogging device like high-speed file servers or workstations on its own Ethernet segment, freeing up the network for everybody else.

And should you want to connect your most bandwidth-hungry users directly to FDDI—you can configure up to 42 fiber connections.



X.400 is now the backbone protocol used to interconnect mail services at the public messaging level. Users, however, can employ one of several access protocols, including direct X.400, LAN gateways or host gateways, to access this level.

In selecting X.400 or any other protocol for either backbone access or switching, users must trade off cost and functionality. In the end, a messaging backbone is a features conduit.

Because X.400 supports more features than any other backbone protocol, little or no message semantics are lost in X.400 as messages are exchanged between dissimilar gateways across the backbone. On the downside, however, more features means more complexity.

> Users must trade off cost and functionality.
>
> ▲▲▲

Meanwhile, far from surrendering their backbone protocol roles to X.400, the Internet Engineering Task Force is enhancing SMTP to provide improved security, directory and multimedia capabilities, while Novell engineers are doing the same with MHS.

The persistence of multiple protocols can be viewed as either a retrograde phenomena or as healthy competition that promotes standards and technology hybridization, which provides better solutions for users.

Rules of thumb

Users don't need to rush into implementing X.400 or any other protocol simply to be a standards bearer. Instead, users should consider the following questions: Is there a strong requirement for intercompany communications? Is the cost of implementing and supporting multiple point-to-point gateways excessive? Will new hardware or software be introduced into the company in the near future?

If the answer to any of these questions is yes, users should seriously consider deploying an X.400 enterprise messaging backbone with multiprotocol access support.

— Daniel Blum

LAN Buyer's Guide

continued from page 36

mentations run on PCs with less than 640K bytes of random-access memory. It is too early to say whether they will gain competitive advantage over proprietary implementations, but large users that are frustrated with gateway problems in their heterogeneous networks might consider giving them a test drive.

"I think native X.400 is a great idea," says Don Gilbert, director of information systems at the American Petroleum Institute in Washington, D.C. "As soon as we can get people testing it and using it, we will know its future prospects. Right now, everybody is starting to plug and play. How does it plug, and how well does it play? That's the question."

Until X.400 takes a firm hold, gateways will remain with us, along with death and taxes. But users have other fish to fry as well. At the Electronic Mail Association's conference in New Orleans last October, users collectively cited the three biggest messaging problems as "directories, directories and directories."

In fact, directories are a key element of the E-mail management problem. If heterogeneous messaging packages are to be integrated, all the users in an enterprise messaging network must be able to look up one another's addresses. The good news is that last year, both LAN E-mail front-end and gateway messaging vendors began to take directories very seriously.

> Until X.400 takes a firm hold, gateways will remain with us.
>
> ▲▲▲

Thus, virtually all of today's LAN E-mail products with server components support directory synchronization in their multiple server networks, in addition to local directory user interface capabilities.

Many vendors, including Beyond, Banyan, cc:Mail, Da Vinci, Enable Software, Enterprise Solutions and Microsoft, plan to be good citizens in the multivendor enterprise directory environment by supporting Retix's multivendor Directory Exchange (DX) protocol.

Even database management system vendor Oracle Corp. plans DX support in its Oracle*Mail package, which works with the firm's line of DBMS software.

X.500 support

In addition, Banyan plans to add CCITT/ISO X.500 support to its StreetTalk Directory product. In the meantime, most products can store X.400 addresses and distribution lists.

As E-mail networks grow larger, more interconnected and more mission-critical, users are increasingly concerned with their management and security. Key features to look for in these areas are remote dial-in access to servers, a multiple server management capability, mailbox administration and client/server password exchange encryption. Vendors such as Banyan, Enable Software and Microsoft are particularly strong in the management area.

While vendors battle it out over which one provides better LAN E-mail features, it appears they agree on at least one thing: how to price their products. Most

(continued on page 47)

ork? It's not the problem it used to be.



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LAN E-mail packages

Vendor	Product	Hardware requirements	Operating System/Network operating system	User interface/ Attachments/ Multimedia features	Gateway/API interfaces	Fax support	Utilities and mail-enabled applications	Local and enterprise directory facilities	Mail system management and security	Pricing and commercial terms
CE Software, Inc. West Des Moines, Iowa (515) 224-1995	Quickmail 2.5	Client: Macintosh Plus or higher; 8088-based PC or higher with 1M byte of RAM; server; dedicated Macintosh SE or higher with 2M bytes of RAM and 1M byte of storage per user	Client: Macintosh System 6.0.5 or higher, DOS 3.1 or higher; server: Macintosh 6.0.5 or higher/ NetWare 2.2, 3.1; VINES 5.0; other LAN operating systems providing Apple AFP-compliant server	Consistent GUI across platforms; TSRs in 10K bytes of RAM for DOS; personal folders; remote TTY dial-in access/Text and binary files/Voice embedding and playback/Application launching	X.400 gateway supplied by Alisa Systems, Inc., Worldtalk, Intercon Systems Corp.; MHS gateway supplied by Starnine Technologies, Inc.; SMTP gateway supplied by third parties/ None	Inbound and outbound	Computer conferencing utility; custom forms allow for phone messages; third-party bulletin board product	Personal address book and server directories; search on last or first name, department; other directory listing fields provided; stores O/R addresses; personal lists only; synchronization across Quickmail servers	Administrator software allows for management and monitoring of mail servers	Single client, $199; 5 clients, $399; 10 clients, $599; 50 clients, $2,499; 100 clients, $4,699; FaxGate, $395; 30-day trial; free technical support; money-back guarantee
Cross Communications Co. Boulder, Colo. (303) 444-7799	Cross Point 5.5	Client: PC with 384K bytes of RAM; server: 256K of disk storage	Client: DOS; server: DOS 3.0, 3.3/NetWare 2.XX, 3.XX; Artisoft, Inc. Lantastic; LAN Manager; 3Com 3+; Invisible Software, Inc.'s Invisible Version 1.61	Character-oriented DOS user interface; TSR in 5K bytes of RAM for message alert and sending; remote TTY dial-in interface/Text and binary files/three level filing system; receipt confirmation; message forwarding; notification; reply	None	None	Bulletin board; notepad; scheduling; phone message; calendar; offers automatic conferences online and traces member involvement in discussions and decisions	Simple name search with user-definable fields	Message encryption between servers	$395 for unlimited clients; 1-year warranty
Da Vinci Systems Corp. Raleigh, N.C. (919) 881-4320	The Coordinator Version II; MacAccess	Client: PC XT or higher; PS/2 with 640K bytes of RAM and 2M bytes of disk storage; Macintosh with MacAccess; server: PC with 512K bytes of RAM and 1.5M bytes of disk storage	Client and server: DOS 3.3 or higher, Macintosh System 6.0.7 or higher with MacAccess/NetWare Version 2.0A or higher; PC LAN; 3Com 3+; VINES	Character-oriented menu interface with DOS; remote dial-in/ Text and binary files/DOS application launching; automatic message sorting and filing	Native MHS; third-party X.400 gateways; SMTP/SMF	Inbound and outbound	7 message types simplifies filing and tracking; group and individual scheduling; conversation manager organizes and tracks communications; not all features available on MacAccess	Hot-key and wild card name and list search; stores X.400 O/R addresses and mixed local or remote lists; directories synchronized across servers	Mailbox management; several utilities for managing mail across servers; NetWare security facilities	$1,800 for 10 clients; $3,000 for 30 clients; $4,500 for 50 clients; $7,500 for 100 clients; Stand-alone Version 2.2 including MHS $600 per remote client; 60-day money-back guarantee MacAccess:
	Da Vinci eMail 2.0 for DOS; Da Vinci eMail 1.8 for Windows; complementary products: Da Vinci eMail 1.8 Combo (DOS, Windows and OS/2); Da Vinci eMail Remote; Da Vinci Names Service; Da Vinci Assistant; Da Vinci SMTP Gateway	Client and server: any PC; Macintosh Plus or higher	DOS 3.X or higher; Macintosh System 6.0.7 or higher; Windows 2.X, 3.0,3.1; OS/2 1.X/ NetWare 2.X, 3.X; NetWare Lite; LAN Manager; VINES	Character-oriented menu interface and TSR in 3K bytes with DOS; GUI with Windows; hierarchical folders/DOS files and viewers for popular applications/ Application launching; DDE and OLE for Windows; voice embedding and playback	Third party-X.400 gateways; built-in MHS; SMTP/Da Vinci APIs	Inbound and outbound	Da Vinci Notes provided free; phone message pad; spell checking; Da Vinci Assistant offers mail forwarding answering and reminder service	Hot-key name search; multiple hierarchical domains; search by any combination of fields; stores X.400 O/R addresses and mixed lists; directories synchronized across servers using Da Vinci Name Service product; support for DX announced	Single-point administration via NetWare; automatic installation and maintenance via NetWare Bindery	DOS Remote, $295; 10-client DOS Starter Pack, $295 plus $100 with MHS; each additional client ranges from $2 to $35; Windows MHS Remote, $150; Windows MHS Server, $1,595; $445 for 8 clients; $1,095 for 30 clients; Da Vinci Names Service, $95 to $395; Da Vinci Assistant, $295 for 10 clients; 60-day trial period; 90-day warranty
Digital Equipment Corp. Maynard, Mass. (800) 344-4825	All-In-1 Mail Version 1	DOS-based PC with 1M byte of RAM; Windows-based PC with 4M bytes of RAM; Macintosh with 4.5M bytes of RAM; DEC Windows-based workstations and VAXes with 14M bytes of RAM; DEC VT terminals	Client: DOS 3.3 or higher; Windows 3.0 or higher; Macintosh System 6.X or higher; server: VMS 5.3 or 5.4/DEC Pathworks VMS Version 4.0 and asynchronous communications	GUI on Macintoshes and Windows; character-based interface for DOS; terminal emulation for remote dial-in access/Text and binary files/DDE support available	Native X.400 UA; DEC MR/X provides an X.400 MTA; MHS gateways supplied by Retix, Joiner Software, Inc., and Worldtalk; DEC Ultrix Mail Connection SMTP gateway; VAX MR/X supports a Programmer's Kit/X.400 API support planned	Inbound and outbound	All-In-1 Mail provides only mail functions; complementary product All-In-1 Integrated Office System provides all office functions	All-In-1 Mail is integrated with DEC's DDS as its user address directory; other facilities provided by DEC's Mailbus including DEC's Data Collector, Directory Registrar, DDS Rapid Replicator, Monitor, Directory Synchronizer, Directory Query	All-In-1 Mail Server provides management utility; message password protection and encryption available; system security at user, directory and file-access levels	Clients are packaged with Pathworks or can be purchased separately at $61 per client; price per server: $605 for license, plus $364 for media and documentation; 1-year warranty

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CMS = Computer Mail Services, Inc.
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DX = Directory Excahnge
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SOURCE: RAPPORT COMMUNICATION, TAKOMA PARK, MD. AND WASHINGTON D.C.

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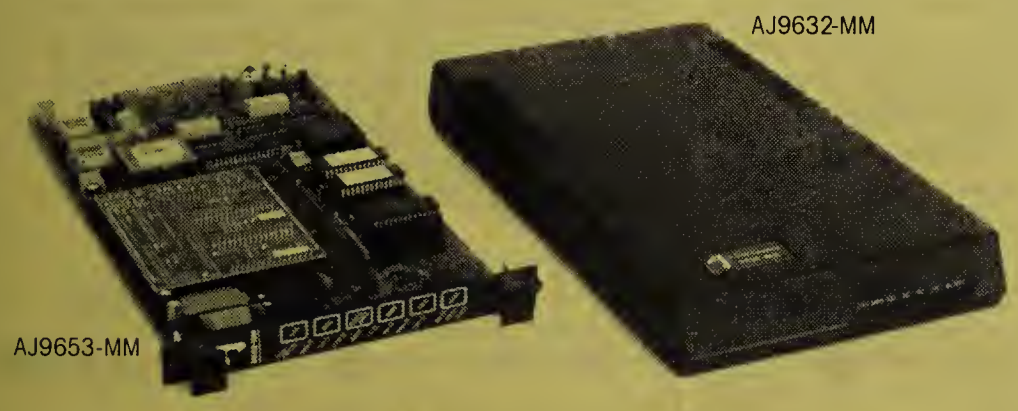
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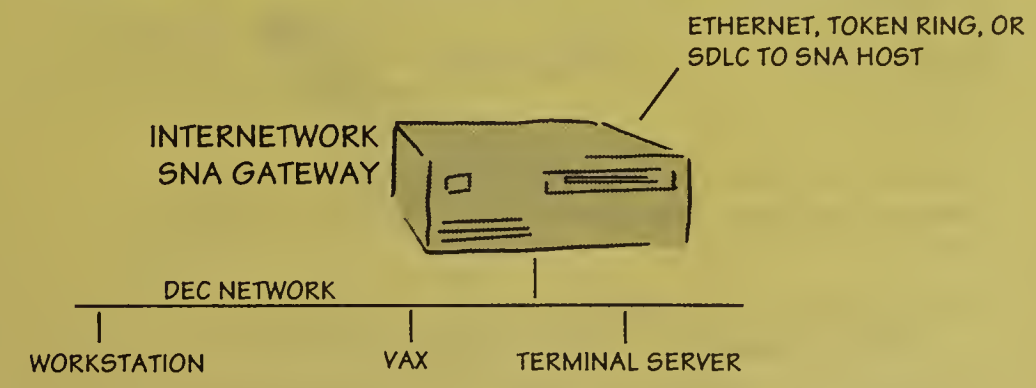
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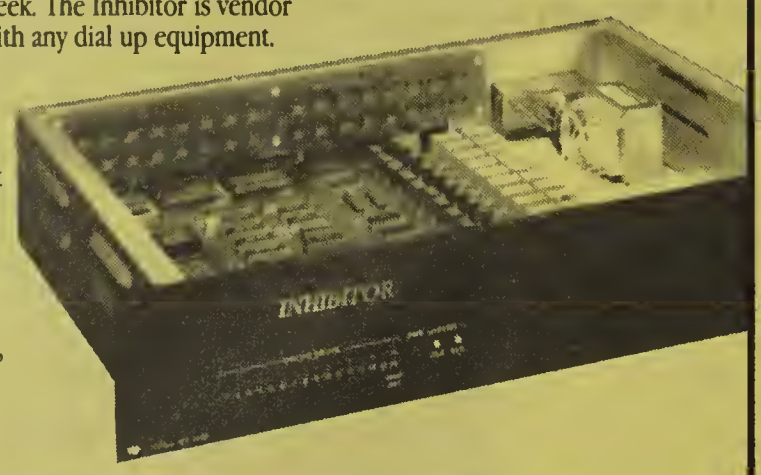


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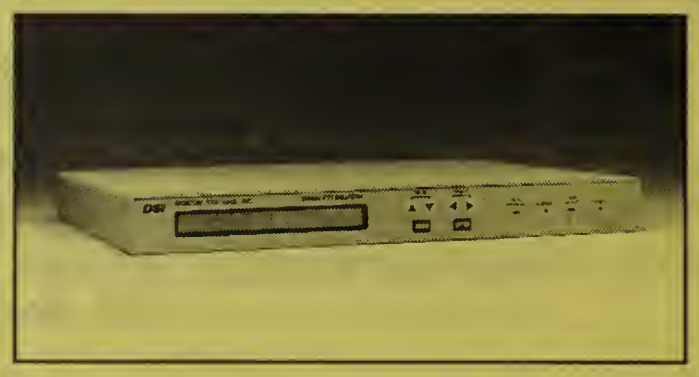


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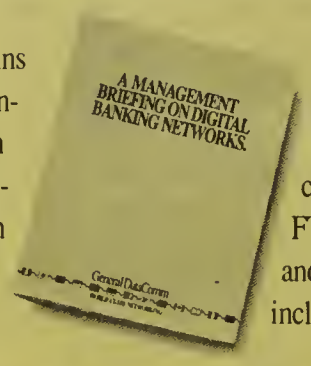
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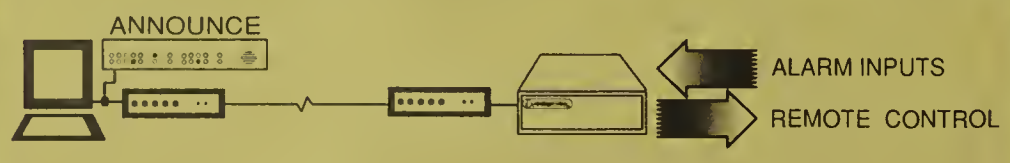
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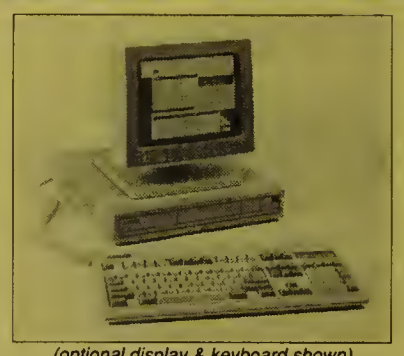
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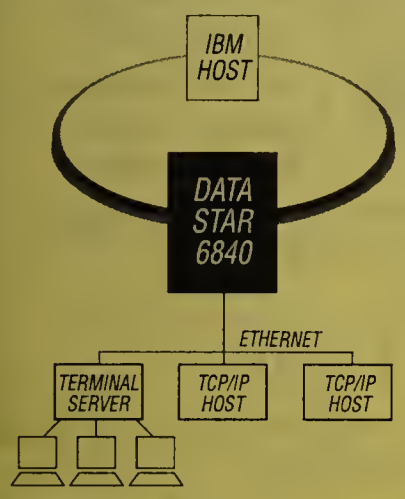
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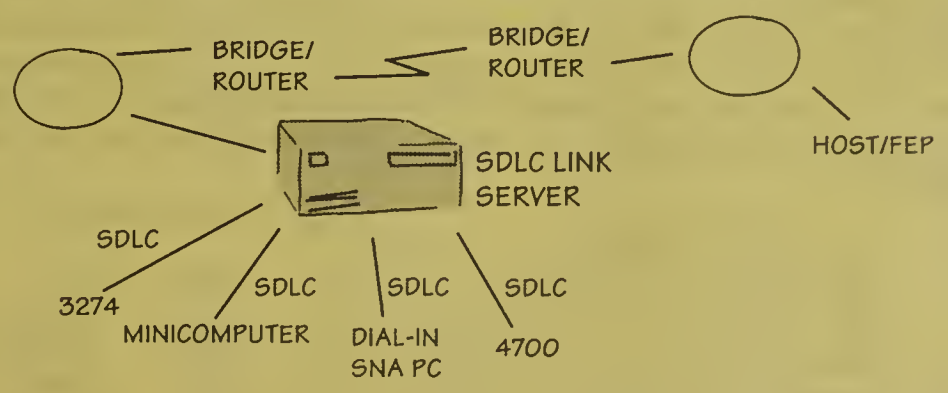
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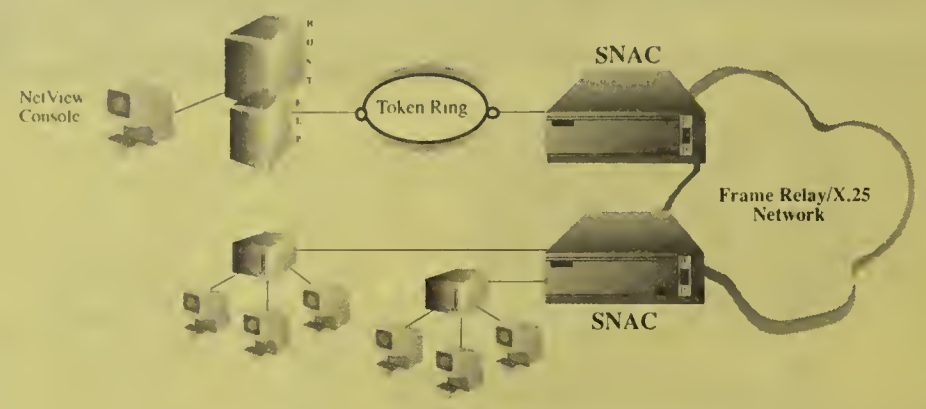
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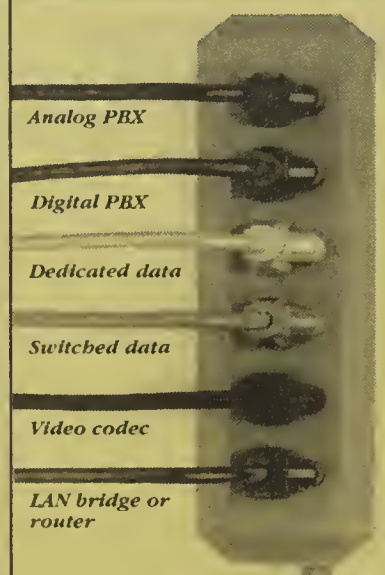
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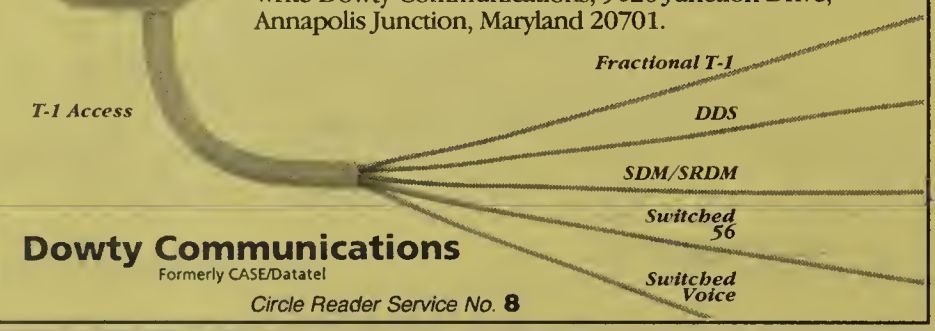


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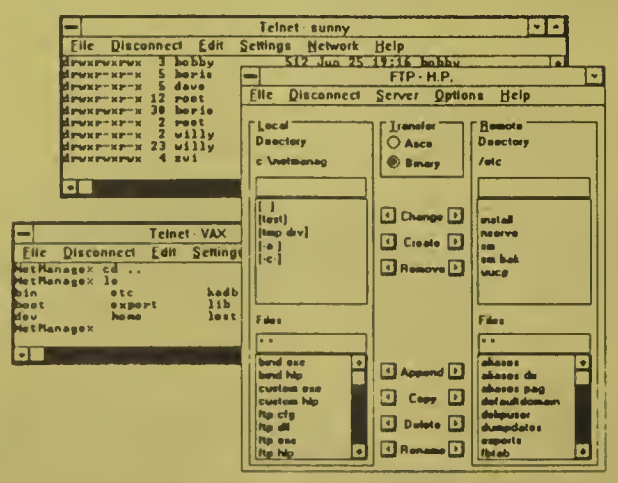
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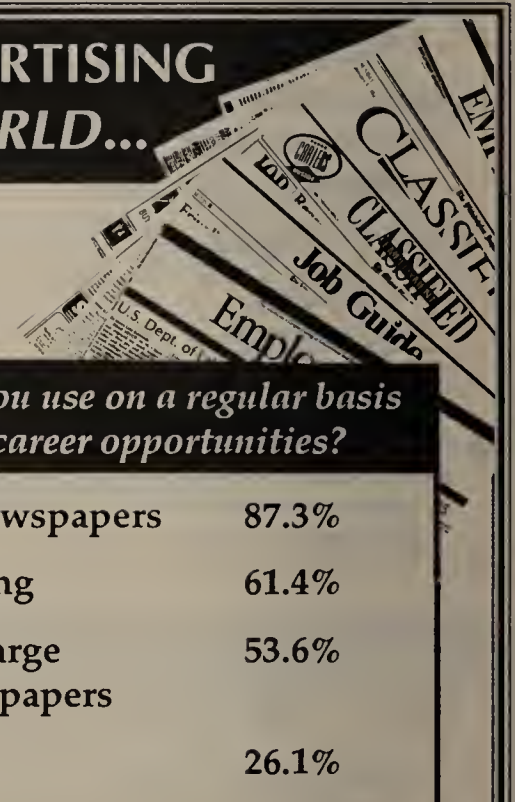
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The Mar 16th Issue
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(*continued from page 39*)
vendors offer usage-sensitive licensing. In some cases, bulk licensing can be obtained with per-user prices in the $20 range.

However, E-mail products tend to have as many separately priced options as a new luxury model automobile. Adding gateways, directory synchronization, monitoring tools and utilities can drive your total costs significantly higher.

Buying or renting a gateway

There is one added cost many users can no longer avoid: buying or leasing a gateway. In today's heterogeneous, information-intensive network computing environment, many users can no longer afford the luxury of purchasing front-end LAN E-mail packages without considering how well they interoperate with other E-mail packages within an enterprise or between different enterprises.

Also, it is important to know which vendors offer interoperability solutions and understand their underlying architecture and limitations.

The LAN E-mail packages chart lists products that support or are close to supporting X.400 and multiprotocol LAN E-mail access. However, point-to-point, SMTP and MHS gateways are available in abundance from LAN E-mail vendors and third-party developers, such as Computer Mail Services, Inc. of Southfield, Mich.

This article examines X.400 gateways only because industry trends are moving away from point-to-point gateways between two vendor-specific products — for example, PROFS to cc:Mail and toured multipoint gateways such as X.400. "If it's not X.400-compliant, don't buy it. Just walk away," ABA's Cary advises users.

> "If it's not X.400-compliant, don't buy it." Cary said.
>
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Although most public service providers support X.400, not all of them currently have multiprotocol LAN access. CompuServe, Inc.'s CompuServe Mail Hub, Infonet Services Corp.'s Notice 400, GE Information Services' LAN Connectors, MCI Mail and Sprint Message Exchange offer multiprotocol LAN access. IBM and AT&T are close to having it.

There are also a number of commercial Internet services, such as New England Academic and Research Network (NEARNET), a project of the Massachusetts Institute of Technology that is operated by BBN Communications Corp.'s BBN Systems and Technologies division. These Internet services have multiprotocol LAN access capabilities available through a LAN gateway supporting either SMTP or the Unix-to-Unix Copy Program.

As with LAN E-mail packages, users' early screening criteria for LAN E-mail gateways will center around hardware, operating system and network operating system capabilities, as well as any prerequisites for connecting to public services. This information essentially defines the basic architecture of the product or service.

However, the step of discovering which LAN E-mail packages can be interconnected through the gateway is also important in the screening process.

Users considering deployment of a multiprotocol X.400 messaging engine will especially want to know which profiles of the X.400's 1984 version are supported and the vendor's plans to support the more advanced 1988 version of X.400 as well as the X.500 Directory Services.

To make interconnection of disparate LAN E-mail packages possible, users must have a reliable directory. Products such as Worldtalk Corp.'s (formerly Touch Communications, Inc.) Worldtalk 400 provide rules-based mapping between LAN E-mail and X.400 addresses.

Also, Soft-Switch's array of gateway products perform mappings using a centralized names directory. Other products, such as Retix's OpenServer, allow X.400 addresses to be generated within the LAN E-mail package. X.400 gateways and messaging engines generally cost more than their SMTP or MHS counterparts. However, the gap is narrowing.

Microsoft, Retix and Worldtalk all sell X.400 Message Transfer Agent (MTA) software for approximately $5,000, and Retix offers its LAN E-mail gateways for $1,795 each. Soft-Switch's gateways start at $4,995 each but offer gateway connectivity to almost every conceivable propri-

(continued on page 49)

Daniel Blum and DML Associates published an enterprise messaging report dubbed "The Messaging Connection: Integrated Messaging based on X.400 and X.500 in the 1990s." It is available for $995. Call (301) 270-6405 or fax (301) 270-2187 for additional information.

New vendor lineup emerging

The LAN E-mail market last year was laden with consolidation. Lotus Development Corp. acquired cc:Mail, Inc., Da Vinci Systems Corp. bought the rights to Action Technologies, Inc.'s The Coordinator, Novell, Inc. bought Action Technologies' Message Handling Service (MHS), and Microsoft Corp. took over Consumers Software, Inc., maker of Network Courier.

Most recently, companies such as Apple Computer, Inc., Borland International, Inc., IBM, Lotus and Novell joined together to announce that each would support a vendor-independent application program interface (API) called Vendor Independent Messaging (VIM). This API will help developers build electronic mail-enabled applications, allowing end users working in a spreadsheet program, for instance, to send an E-mail message without having to exit the spreadsheet application.

Currently, end users must exit the spreadsheet and call up the E-mail program in order to send a message.

VIM is commonly seen as a body blow to Microsoft's efforts to attract third-party developers for building mail-enabled applications using Microsoft's Messaging Application Programming Interface.

However, since both Novell and Apple will support VIM in addition to their own APIs, the VIM announcement effectively reduces the number of APIs from which third-party developers must choose to support.

Among smaller local-area net E-mail vendors, there is diversity and churn. Vendors that were prospering two years ago, such as 3Com Corp. and Simpact Associates, Inc., have gotten out of the LAN E-mail business altogether.

Yet for every vendor dropping out of the market, it seems that two more — often small start-up companies such as Infinite Technologies and OCP International, Ltd. — take their place.

The LAN E-mail market is also being targeted by established entrants. Large systems vendors, such as Digital Equipment Corp. and Hewlett-Packard Co., are positioning themselves to provide total enterprise mail solutions, including messaging backbone switches and LAN client software, such as DEC's All-In-1 and HP's AdvanceMail for personal computers.

> For every vendor dropping out, two more take their place.
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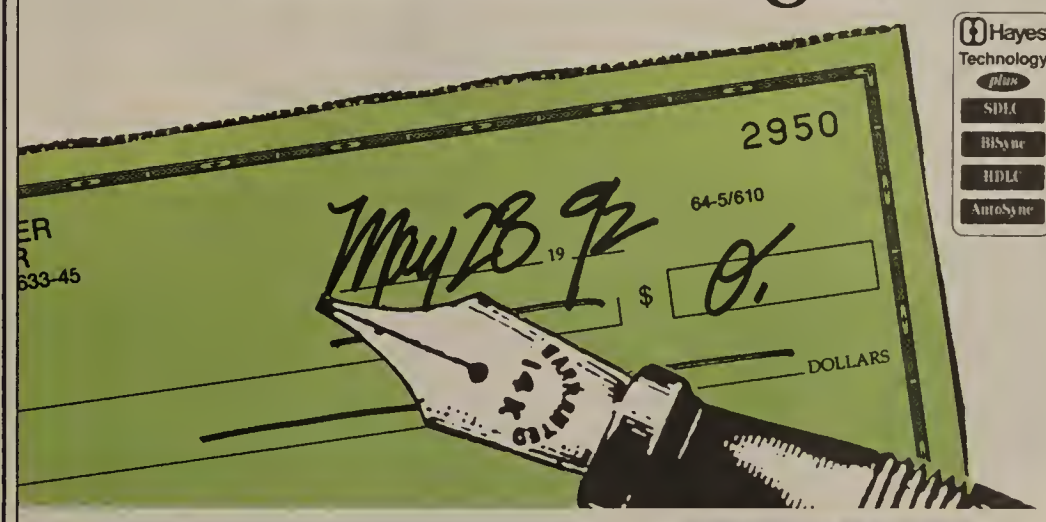
These offerings will more than likely be employed by users that already have a significant amount of a particular systems vendor's equipment installed.

In other cases, large users are standardizing on leading LAN E-mail products, such as cc:Mail, Da Vinci's eMail, Microsoft Mail for PC Networks and Banyan Systems, Inc.'s VINES Network Mail, to provide a uniform service.

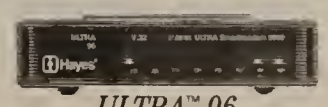
"There are niches in small to midsize companies for innovative, highly functional, specialized products," says Joe Barbera, vice-president of marketing for Transend Corp. of Portola Valley, Calif. LAN E-mail packages targeting these smaller users include Transend's Complete-Mail/MHS and Beyond, Inc.'s BeyondMail.

— Daniel Blum

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LAN E-mail packages

Vendor	Product	Hardware requirements	Operating System/Network operating system	User interface/ Attachments/ Multimedia features	Gateway/API interfaces	Fax support	Utilities and mail-enabled applications	Local and enterprise directory facilities	Mail system management and security	Pricing and commercial terms
Enable Software, Inc. Ballston Lake, N.Y (518) 877-8600	Higgins Mail Version 2.4; complementary product: Higgins Group Productivity Software Version 2.4	Client: Any PC with 512K to 640K bytes of RAM; server: Any PC with 270K bytes of RAM and 1.5M bytes of disk storage	DOS 3.1 or higher; OS/2/ NetWare; 3Com; VINES; LAN Manager	Character-based menus and function keys; TSR alerts under DOS; Higgins Remote provides access for laptop or remot user; message archival in relational database with key word search, linkage to calendar and other events/Text and binary files/ Switches between E-mail and other applications with 1 keystroke	X.400 gateway supplied by Retix; MHS; SMTP gateway supplied by CMS; Soft-Switch gateway to IBM's SNA Distribution Services/Higgins API provided for building mail-enabled applications	Outbound	Higgins Group Productivity Software provides calendar; scheduling; to-do lists; expense reports; key word retrieval; phone messages; mail merge; supports groupware functions as mail-enabled applications	Name, address, phone number, company, E-mail fields; all fields can be searched; includes full relational DBMS-like searches including wild cards; Higgins Name Synchronization product provides automatic propagation across Higgins networks; support for D/S and DX announced	Higgins Exchange 2.0 provides full system reporting and exception alerts for interrupted service, single-point administration for wide-area Higgins messaging networks; complete message encryption; dual passwords	Higgins Server Kit, $295; expansion kits, 4 clients, $149; 12 clients, $349; 20 clients, $495; 100 clients, $1,995; Higgins Remote, $395; Name Synchronization, $995; Higgins Exchange, $995; To:MHS, $495; To:FAX, $995; Higgins Group Productivity Server Kit, $695 (includes Higgins Mail); expansion kits, 4 clients, $349; 12 clients, $995; 20 clients, $1,495; evaluation packages, $49.95
Enterprise Solutions, Ltd. Westlake Village, Calif. (818) 598-8943	Enterprise Mail; Enterprise Directory	Client: DOS-based PC ATs with 640K bytes of RAM; Windows-based PC AT with 1M byte of RAM; server: any hardware with an X.400 MTA supporting Retix remote file-access mechanisms	Client: DOS 3.3 or higher; Windows 3.0 ; Unix/ NetWare, LAN Server; LAN Manager; VINES; Sun Microsytems, Inc.'s Network File System	GUI and remote dial-in support; TSR for DOS/Text and binary files/ Applications supporting OLE and DDE will be launchable in next release	Native support for 1984 and 1988 versions of X.400; requires third-party MTA for transport; MHS and SMTP gateways supplied by Retix/XAPIA specifications	Planned for future release	None	Full search for names, aliases and nicknames in local directory, including wild card searches; hot-keying; Soundex search algorithm in system directory; synchronization across unlimited MTAs; supports X.500 Directory Services and DX	Management provided for user, directory, MTA and mailbox administration; full mail management with logs for multiple MTAs; local and remote user accounting; message encryption and password-protection	Single client, $295; 100 clients, $10,000; substantial reductions with site license; Enterprise Directory: $495; 90-day warranty; maintenance and technical support available at 15% of list price per year
Fischer International Systems Corp. Naples, Fla. (800) 237-4510	Electronic Mail Communication Center/Totally Automated Office (Emc^2/TAO)	Client: PC with 400K bytes of RAM; server: PC with 4M bytes of RAM	DOS 3.X; Windows 3.X/ NetWare; LAN Manager; VINES	Graphical- and character-based interfaces; laptop and remote dial-in support;TSRs for DOS/Text and binary files/OLE for Windows Application launching	Native X.400 features planned for 1992; Fisher-developed X.400 Gateway; MHS; · SMTP/Proprietary API	Outbound; inbound scheduled for 2Q	Graphical calendar, scheduling and to-do list utilities packaged with the product; API offers tie-in integration with other business applications	On-line directory with searching and sorting on Mail identifiers, Department and Alias fields; synchronization is implemented through the Emc2/TAO API; Soft-Switch D/S and X.500 planned	Administrator facility includes reporting for auditing and charge-back; integration with other Fischer LAN security products planned	1 to 25 clients, $600; additional 100 clients, $500; host-based Emc^2/TAO Networking, $8,000; OS/2-based Emc^2/TAO Networking, $2,500; 30-day free trial period with free technical support
Frontier Technologies Corp. Mequon, Wis. (414) 241-4555	Super OSI (X.400-based)	PC with 2M bytes RAM and 3M bytes of disk storage	DOS 3.3 or higher and Windows 3.0/NetWare 3.11	GUI; folders support/Text and binary files/None	Support for 1988 version of X.400 MTA; MHS gateway planned; X.400 API A specification	None	OSI-based facilities, including File Transfer, Access and Management; message filtering and automatic actions	Stores X.400 O/R addresses and distribution lists; X.500 support planned	None	$1,995 to $3,500; free upgrade and telephone support for 1 year; bulletin board service; 90-day warranty; 30-day evaluation
	Super TCP (SMTP-based)	PC with 1M byte of RAM and 2.5M bytes of disk storage	DOS 3.3 or higher and Windows 3.0/NetWare 3.11	GUI; folders supported/None/ None	SMTP; MHS planned/SMTP Mailer and Server API	None	TCP/IP facilities including Telnet and File Transfer Protocol; message filtering and automatic action	Stores names and distribution lists	Internet privacy enhanced mail encryption	$495, with options ranging from $95 to $595
Futurus Corp. Atlanta (800) 327-8296	Right Hand Man II; Right Hand Man Remote; Right Hand Man for Windows; Right Hand Man WAN (name changing to Futurus Team)	Client and server: PC XT or higher with 256K bytes of RAM	Client: DOS 3.3 or higher; Windows; server: DOS/ NetWare 2.1X or higher; NetWare Lite; Lantastic	GUI and character-based user interface; TSR for DOS; dial-in software without terminal emulation/Text and binary files/Voice embedding and playback through Artisoft Sounding Board	X.400 support supplied by Retix or Soft-Switch; MHS; SMTP supplied by MHS and CMS' Sbridge	Inbound and outbound supplied by MHS	Group calendaring, conferencing; real-time chat; to-do list; key word searching	Directory contains user names, network identification names and group names; X.400 O/R addresses can be stored; hot-key search	Message logs; password-protected user identification	5 clients, $495; 25 clients, $1,995; Right Hand Man Remote, $295; single-client Right Hand Man for Windows, $495; 25 clients, $1,995

AFP = Apple File Protocol
API = Application Program Interface
CMS = Computer Mail Services, Inc.
DDE = Dynamic Data Exchange
DDS = Distributed Directory Service
D/S = Directory Synchronize
DX = Directory Excahnge
GUI = Graphical user interface
MAPI = Messaging Application Program Interface
MHS = Message Handling Service
MTA = Message tranfer agent
OLE = Object Linking and Embedding
OMI = Open Messaging Interface
O/R = Originator/requestor
PROFS= Professional Office System
RAM = Random-access memory
SMF = Simple Message Format
SMTP = Simple Mail Transfer Protocol
TSR = Terminate and stay resident
TTY = Teletypewriter terminal
UA = User Agent
UUCP = Unix to Unix Copy Program
XAPIA = X.400 Application Program Interface Association

This chart includes a representative selection of LAN E-mail packages. These vendors may offer other packages, and other vendors not included may offer a full range of products.

SOURCE: RAPPORT COMMUNICATION, TAKOMA PARK, MD. AND WASHINGTON D.C.

LAN E-mail packages

Vendor	Product	Hardware requirements	Operating System/Network operating system	User interface/ Attachments/ Multimedia features	Gateway/API interfaces	Fax support	Utilities and mail-enabled applications	Local and enterprise directory facilities	Mail system management and security	Pricing and commercial terms
Hewlett-Packard Co. Cupertino, Calif. (408) 725-8900	HP AdvanceMail Version A.04.01 for DOS or Windows; HP NewWave Mail Version A.03.00 for Windows or New Wave; HP OpenMail; other clients provided for various platforms	Client: HP Vectra, PC with 640K bytes of RAM for AdvanceMail or 2M bytes of RAM and 40M bytes of storage for NewWave Mail; server: HP 9000, IBM RISC/ System 6000, DEC System 5100, other 80386- or 80486-based systems	Client: DOS; Windows; server: HP-UX; IBM AIX; DEC Ultrix; The Santa Cruz Operation, Inc.'s SCO Unix/TCP/IP	GUI for NewWave Mail; character-based windows for AdvanceMail; terminal emulation provided; hierarchical folders in NewWave Mail/Text and binary files/ Application launching supported; voice embedding and playback in NewWave Mail	Native X.400 UA; X.400 supplied by HP MTA; SMTP supplied by HP OpenMail; MHS supplied by third party/Full API set for mail-enabled applications	Outbound supplied by HP OfficeFax	Various utilities provided by Windows and HP NewWave; limited mail filtering with AdvanceMail	Hot-key search of X.500 Directory; stores local addresses, X.400 O/R addresses, remote user addresses, mixed distribution lists and many other fields; directory synchronization within HP OpenMail and HP DeskManager	Statistical reports; comprehensive logging and auditing of system events; configurable maintenance times; proactive monitoring facility; computer-based problem solving; advanceMail passwords encrypted; messages encrypted for transmission over Unix Sendmail-based packages	OpenMail: 4 clients, $300; each additional client, $200; AdvanceMail: single client, $420; each additional client, $370; 50 clients, $2,500; NewWave Mail: single client, $195; each additional client, $170; 50 clients, $2,500; OpenMail MTA server, $3,500 to $23,500; OfficeFax, $6,000; standard HP warranties apply
Infinite Technologies Owings Mills, Md. (410) 363-1097	ExpressIt!	Client: PC with 384K bytes of RAM; server: PC with 512K bytes of RAM	Client: DOS 3.X; Windows 3.X; server: DOS 3.X/NetWare 2.X and 3.X	Character-based menu interface for DOS; 2K bytes of TSR; GUI for Windows; multiple folders/Text and binary files; graphic image and FAX viewers included	MHS; X.400 supplied by MHS; SMTP supplied by MHS using CMS Sbridge or Ugate/SMF; custom development tools available	Inbound and outbound	Chat optional; complementary PageIt! and FowardIt! products support communications with alphanumeric pagers	ExpressIt! Directory Assistance address book contains host, user name and full name; stores X.400 O/R addresses, mixed lists; synchronization available between ExpressIt! servers	Utility program facilities automated setup and configuration in NetWare environments	ExpressIt! base system with 5 clients, $299; 10 clients, $499; 25 clients, $699; 100 clients, $999; unlimited clients, $1,999; ExpressIt! for Windows is $299 extra; PageIt!, $199 to $699; 30-day evaluation

(continued from page 47)

etary E-mail package — LAN or other wise — via the Soft-Switch Central product. In all cases, a dedicated hardware platform must be allocated to run the MTA.

On the other hand, Microsoft offers an MHS gateway for $995, while its SMTP gateway costs $4,995.

By contrast, public messaging services such as CompuServe Mail, MCI Mail and SprintMail require no dedicated equipment. In addition, SprintMail and CompuServe Mail do not require up-front software costs. Instead, the service provider often levies an initial installation fee and then charges on a per-message basis. Infonet Services Corp. resells OSIware, Inc., Retix and Soft-Switch products, and offers turnkey installation in addition to a variety of facilities management solutions to complement its Notice 400 service.

While it is difficult to interconnect LAN E-mail packages today, the future looks bright. The quality of gateway, directory and management software is improving, and native X.400 interfaces are making a debut. In addition, the next several years are likely to bring multivendor directory synchronization solutions, more X.500 products and continued hybridization of X.400, SMTP and MHS backbone protocols.

LAN E-mail vendors and third-party developers are also firming up support for one or two of the de facto standard messaging APIs that will ease mail-enabled application development.

If these trends continue to flesh out, LAN E-mail will be on the verge of fulfilling its mission: to enable multimedia office automation through an interoperable messaging flow as ubiquitous as electricity.

ADDENDUM: The following products were inadvertently omitted from the frame relay equipment Buyer's Guide (*NW*, Feb. 3):

■ Gandalf Systems Corp.'s Infotron 2300 switch module, Infotron 2120 multiplexer module and Access 2590 gateway that access frame relay services up to 2.048M bit/sec. Each supports the Local Management Interface (LMI), ANSI Annex D and T1.606 standards. The 2300 module costs $6,000, while the 2120 module costs $2,500. Both modules will ship in June. Available now, the Access 2590 costs $8,995. Each device is being tested for carrier compatibility. For more information, call (609) 424-9400.

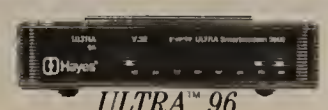
■ Larse Corp.'s Split-T multiplexer, which provides T-1 access to frame relay services, and the Access-T data service unit/channel service unit, which provides 56K bit/sec access. Both are compatible with WilTel's service and are available. Split-T prices start at $3,495, while Access-T prices start at $2,845. For more information, call (408) 988-6600.

■ Motorola Codex's 6507 packet assembler/disassembler, 6525 packet switch and 6742/45 multiplexer. The 6507 and 6525 access frame relay services up to 80K bit/sec. Both support Annex D and CCITT's Backward Explicit Congestion Notification standards. Both are being tested with AT&T, CompuServe, Inc., US Sprint Communications Co. and WilTel frame relay services. Available now, the 6507 costs $2,570 to $14,425, while the 6525 costs $5,250 to $37,770. The 6742/45 accesses frame relay service up to 128K bit/sec and will be tested with US Sprint and WilTel services. Available this month, the 6742/45 costs $5,500 to $35,000 plus $1,200 for frame relay support. For details, call (508) 261-4000.

■ Vitalink Communications Corp.'s TransPATH 350, 335, 550 and 530 routers; 6600, 6400 and 6800 Bridge/ Routers; and 8800 Bridge/Router/ Switch that access frame relay services up to 2.048M bit/sec. Each product supports LMI and Annex D standards. The TransPATH suite will ship in the third quarter, while the other devices will ship in the second quarter. Prices start at $17,000 for the 350 and 550; $13,500 for the 335; $12,500 for the 530; $6,000 for the 6600; $17,600 for the 6400; and $24,500 for the 6800. Pricing for the 8800 will be set later this year. For more information, call (800) 443-5740.

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LAN E-mail packages

Vendor	Product	Hardware requirements	Operating System/Network operating system	User Interface/ Attachments/ Multimedia features	Gateway/API Interfaces	Fax support	Utilities and mail-enabled applications	Local and enterprise directory facilities	Mail system management and security	Pricing and commercial terms
InTouch Software, Ltd. San Francisco (800) 638-6824	Personal Mail (a front-end tool for linking PCs to IBM's PROFS and OfficeVision/VM)	Client: PC with 640K bytes of RAM and 1M byte of storage; server: IBM mainframe	Client: DOS Version 3.2 or higher; server: VM/CMS on mainframe with PROFS (separately provided)/Any PC LAN operating system supporting a 3270 gateway	GUI for Windows 3.0; character-based menus for DOS; TSR for DOS; user-defined folders/Text and binary files/ Preserves application name; launches application in Windows; DDE mail-enabling for Windows; voice embedding and playback	X.400 and SMTP supplied by IBM OfficeVision/VM or PROFS	Inbound and outbound	User can run Personal Mail while logged onto IBM host; personal calendar; message sorting; message filtering; mail-enabled applications can be programmed in Personal Mail's script language; scripts executed when message is sent or received; scripts can be scheduled for execution later	PROFS/OfficeVision directory can be downloaded to the PC for read-only search; mixed lists supported; name checking on message submission can be enabled or disabled by user	Minimal administration required; mailbox management performed on host; logs synchronized with host; messages can be encrypted or password protected	$350 each for the first 10 users or less; volume discounts and site license pricing available; 90-day warranty; $36 per copy for maintenance program, under which user receives all upgrades and hot line support
Microsoft, Corp. Redmond, Wash. (206) 882-8080	Microsoft Mail for PC Networks Version 2.1	Client: DOS-based PC AT with 384K bytes of RAM; OS/2-based PC or IBM PS/2 with 4M bytes of RAM; Windows-based PC with 640K bytes of RAM; MacIntosh Plus, Macintosh Classic, Macintosh SE, Macintosh LC, Macintosh II or Macintosh Portable with 1M byte of RAM; server: PC AT or PS/2 with 640K bytes of RAM; 10M bytes of disk storage recommended for PS/2-based servers	Client: DOS 3.1 or higher, Macintosh System 6.0.2 or higher; server: DOS 3.1 or higher/Any LAN operating system that supports DOS file sharing; Apple's AppleTalk or Ethertalk	Character-based menus and TSRs for DOS; GUI for OS/2, and Macintosh; personal, shared and group hierarchical folders; messages sorted for viewing by name, date, subject and priority; remote user interfaces for laptops/Text and binary files/Application launching with Windows 3.0; voice embedding and playback on Macintosh; file compression; virus protection	Supports 1984 version of X.400, including NIST GOSIP implementations; third-party X.400 gateways from Worldtalk and Retix; Microsoft Mail Gateway to MHS; Microsoft Mail Gateway to SMTP; gateways to PROFS, MCI Mail and GE Information Services Quik-Com/File Format API; Microsoft's MAPI planned	Inbound and outbound supplied by Microsoft Mail Gateway for Fax	Phone message; Acius, Inc.'s 4th Dimension External Kit allows custom applications to be built using 4th DBMS and Microsoft Mail for PC Networks; third-party Network Scheduler provides work group calendaring; Aldus PageMaker and Microsoft Word support Microsoft Mail for PC Networks	3-tiered directory with personal address book, local server and enterprise levels; hot-key name search of name, alias and post office fields with wild card support; additional fields and field lengths can be customized by administrator; X.400 O/R addresses and mixed lists; directory propogation to all servers, including those linked by gateways; support for D/S and DX, and possibly IBM Enterprise Address Book planned	Administrator can set user access levels for sending, receiving, deleting and creating messages with urgent priority levels; message storing on workstation or in server; message storage and management utilities; detailed communications logs/Messages encrypted between servers	Server with single client, $695; remote workstation, $195; 5 clients, $395; 20 clients, $1,349; 100 clients, $5,500; 500 clients, $22,500; Microsoft Mail Connection for PC and AppleTalk Networks, $295; X.400 Gateway, $4,995; SMTP Gateway, $4,995; SMTP Access, $2,495; Fax Gateway, $1,995; MHS Gateway, $995
Notework Corp. Brookline, Mass. (800) 767-6683	Notework; Notework Remote; Notework FAX; Notework/MHS Gateway; Notework/UUCP Gateway; Notework Forms Compiler and Developer's Tool Kit	Client: PC with 5K bytes of RAM; sever: any hardware that can support LAN operating systems	Client: DOS; Windows; server: DOS 3.1 or higher/NetWare 2.XX or 3.XX Portable NetWare; NetWare for VMS	Character-oriented menu interface; 5K TSR under DOS; cut and paste from underlying screen during message creation/Text and binary files/Voice embedding and playback using Voxlink Corp.'s Voxmail	MHS; X.400 gateways supplied by Retix, Worldtalk and Frontier; MHS-to-X.400; SMTP supplied by CMS' Sbridge; Notework-to-UUCP gateway/Notework Forms Compiler and Developer's Took Kit includes APIs	Inbound supplied by major LAN fax server products; Notework FAX provides simple send-only fax option for Notework users without dedicated PC or fax server	Instant, interactive telephone messaging; Forms Compiler enables easy template creation; third-party group scheduling products available	Hot-key name search facility maintains list of local and remote users; user-definable fields; search and tag on any field; stores X.400 O/R addresses (optionally behind aliases), mixed lists; synchronizes directory list of up to 3,500 users on as many as 14 servers	Logs all mail and allows searching and archiving by user-defined criteria; allows administrator to delete mail by various criteria; provides mail volume and usage statistical monitoring	System Disk, $99; Notework DOS, 10 clients, $399; 50 clients, $1,499; Notework Windows, 10 clients, $599; 50 clients, $2,249; Notework MHS Gateway, $199; Notework Remote, $149 (includes personal MHS); Notework FAX, $399; Notework UUCP Gateway, $399; Notework Custom Forms Compiler and Developers Toolkit, $199; 30-day trial period
OCP International, Ltd. Ascot, England (818) 892-5192 or 44-344-874569 (for Ascot)	OCP-Mail, OCP-Mail 400	PC with 640K bytes of RAM	Client: DOS; Windows 3.0; OS/2; server: DOS; OS/2; Unix/ NetWare; LAN Manager	GUI under Windows; native X.400 user interface with OCP-Mail 400; complementary OCP-Archive facility; icon and alarm options alert user of new mail/Text and binary files/None	X.400; MHS; SMTP supplied by third party/ XAPIA's Application and Gateway APIs; SMF; additional internal APIs	Inbound and outbound	Provided through complementary OCP-Time-Manager, Address Book, and Archive products; calendars, to-do lists	X.500-like information models supported; X.400 O/R addresses and mixed lists stored	Management and monitoring facilities provided through Retix OpenServer and MHS	OCP-Mail, single client, $525; 10 clients, $920; 25 clients, $2,060; 50 clients, $3,440; 100 clients, $5,505; 200 clients, $7,880; OCP-Mail 400, single client, $655; 10 clients, $1,155; 25 clients, $2,595; 50 clients, $4,325; 100 clients, $6,920; 200 clients, $7,880; MHS-to-X.400 Gateway, $2,900; 6-month warranty

AFP = Apple File Protocol
API = Application Program Interface
CMS = Computer Mail Services, Inc.
DDE = Dynamic Data Exchange
DDS = Distributed Directory Service
D/S = Directory Synchronize
DX = Directory Excahnge
GUI = Graphical user interface
MAPI = Messaging Application Program Interface
MHS = Message Handling Service
MTA = Message tranfer agent
OLE = Object Linking and Embedding
OMI = Open Messaging Interface
O/R = Originator/requestor
PROFS= Professional Office System
RAM = Random-access memory
SMF = Simple Message Format
SMTP = Simple Mail Transfer Protocol
TSR = Terminate and stay resident
TTY = Teletypewriter terminal
UA = User Agent
UUCP = Unix to Unix Copy Program
XAPIA = X.400 Application Program Interface Association

This chart includes a representative selection of LAN E-mail packages. These vendors may offer other packages, and other vendors not included may offer a full range of products.

SOURCE: RAPPORT COMMUNICATION, TAKOMA PARK, MD. AND WASHINGTON D.C.

LAN E-mail packages

Vendor	Product	Hardware requirements	Operating System/Network operating system	User interface/ Attachments/ Multimedia features	Gateway/API Interfaces	Fax support	Utilities and mail-enabled applications	Local and enterprise directory facilities	Mail system management and security	Pricing and commercial terms
Reach Software Corp. Sunnyvale, Calif. (408) 733-8685	MailMAN	80286-based PC or higher	DOS 3.1 or higher; Windows 3.0 or higher; OS/2 planned/ VINES 4.10 or higher; NetWare 2.1 or higher with MHS 1.5 or higher	GUI/Text and binary files/DDE; files sent as attachments for any Windows application can be launched from MailMAN	MHS and VINES Network Mail used for message transport; working with Novell to certify MailMAN with third party X.400-to-MHS gateways/Application access supplied by VINES API and MHS file service interface; plans to support OMI, Microsoft MAPI	Outbound supplied by third-party vendors via fax gateway capability in MHS or VINES	Integrated with various utilities supplied by Windows; support for application templates for user or third party-developed utilities planned; complementary product WorkMAN will provide a mail-enabled work flow platform when released this year	Integrated StreetTalk and StreetTalk Directory Assistance in VINES; integrated with the Bindery and Netdir name registries in NetWare	Supports management and security functions available in the LAN operating system	NetWare-based MailMAN, with MHS and 5 clients, $349; 25 clients, $995; unlimited clients; VINES-based MailMAN with 20 clients, $995; unlimited clients, $1,995
Transend Corp. Portola Valley, Calif. (415) 851-3402	Complete E-Mail/MHS	PC AT with 320K bytes of RAM	DOS/NetWare; PC LAN; VINES	Character-oriented menus and function key interface; pop-up TSR with instant mail notification capability; up to 16 user-definable folders; remote dial-up access/ Text and binary files/None	X.400 supplied by Retix and Worldtalk; interfaces to various public messaging services and private mail systems; MHS supplied by third party; SMTP supplied by CMS/None	Outbound	Message filtering and DOS calls for invoking other applications; user-designed forms with protected fields can be sent, filled out and returned electronically	On-line address book of local and remote users with nickname, user name, and X.400 O/R name fields; searches on nickname; supports mixed lists	Minimal management capabilities needed because product primarily interfaces with public E-mail or MHS; messages encrypted for additional security	5 clients, $295; 10 clients, $495; 60-day trial period

Internet community embraces SNA

continued from page 6

The other key feature is media conversion software that enables it to support token rings and serial links.

Proteon, Inc. is taking a similar tack. It was the first vendor to outline plans to concurrently support token-ring and serial-line SDLC traffic when the company announced its SNA strategy last summer. The firm's router will support wide-area net interfaces on one side and ports for LANs and serial devices, such as cluster controllers, on the other.

The firm supports IBM LAN and SNA terminal traffic by encapsulating it in TCP/IP packets. Long-term, its SNA strategy hinges on the availability of IBM's Advanced Peer-to-Peer Networking (APPN) network node specification, which IBM has pledged to publish.

IBM's approach for its recently announced 6611 Network Processor multiprotocol router is similar to Cisco's and Proteon's. IBM's Data Link Switching architecture will enable the 6611 to convert SDLC to LLC2, establishing SDLC to be carried over LANs.

Wellfleet Communications, Inc.'s bridge/routers currently support SNA via source route bridging for token-ring LANs, as well as the SNA and SDLC encapsulation methods similiar to those of Cisco, IBM and Proteon.

Paul Severino, Wellfleet's president and chief executive officer, said the vendor will soon announce enhanced support for SNA traffic. The firm's plans for APPN support is also contingent on the availability of the APPN network node specification.

To tackle the onerous chore of moving serial-attached devices onto the internet, both Proteon and Wellfleet said they may partner with an SNA gateway vendor to develop more seamless support.

The Travelers' Simon said one of the key router considerations is the ability to limit overhead.

"Reducing overhead traffic is our No. 1 requirement. If we can control that, we can recapture a significant part of our network and realize tremendous savings on our wide-area line costs," Simon said. Nearly 50% of the data traversing The Travelers' WAN is session and broadcast overhead.

Firm offers inexpensive options

continued from page 17

SNMP agent software that provides management statistics to LanExec, Hou said.

Second, it can be managed by Novell's recently announced NetWare Management System (NMS).

The AQ-IHUB-12TP contains a Novell Hub Management Interface driver that enables it to be managed by the NMS when it is placed a NetWare server, Hou said.

If users choose to utilize the AQ-IHUB-12TP as an unmanaged hub, it can still be upgraded to a managed configuration by either purchasing the LanExec software or inserting it into a Novell server, he explained.

The hub, which is currently available, is priced at $999. That price, however, does not include the additional SNMP software. LanExec is priced at $499 for a 20-user package.

Letters

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foundations and the Department of Defense with the counterpart from Europe or Japan? No, few would do so if they had to confront the awful consequences of government-directed economic and industrial policy making.

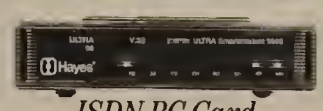
However, some naive idealists actually believe that there could be an elite cadre that could see all the threads and divine where they lead. I am not one of them.

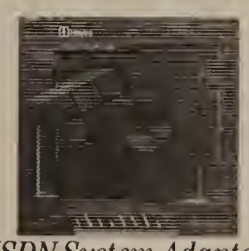
I say "no, thank you" to any information technology policy. Instead, I prefer the wonderfully selective chaos and discipline of the market to all the brilliant planning I have seen.

Kenneth Hoyt
President
KSH International, Inc.
Tampa, Fla.

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Firm unveils NPSI alternative

continued from page 1

any device that uses SDLC, such as cluster controllers, to be linked to a token ring.

Last week, Sync Research announced frame relay and X.25 interfaces on the SNAC/TRC, enabling an IBM front-end processor on one token ring to ship traffic over wide-area frame relay or X.25 links (see graphic, this page). Support for X.25 obviates the need for IBM's front end-based Network Control Program (NCP) Packet Switching Interface (NPSI) X.25 software, said Lynn Nye, director of product marketing for Sync Research.

IBM is not scheduled to deliver frame relay support on its front ends until September, whereas the SNAC/TRC will be available in the second quarter.

Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C., said the SNAC/TRC would be a less expensive X.25 option than NPSI and would save expensive front-end cycles. "It's an inexpensive way to experiment with frame relay," he said.

SNAC/TRC costs $9,650, including a token-ring adapter and support for two 64K bit/sec links or a single 128K bit/sec wide-area link. NPSI ranges in price from about $13,750 to $37,000, according to IBM.

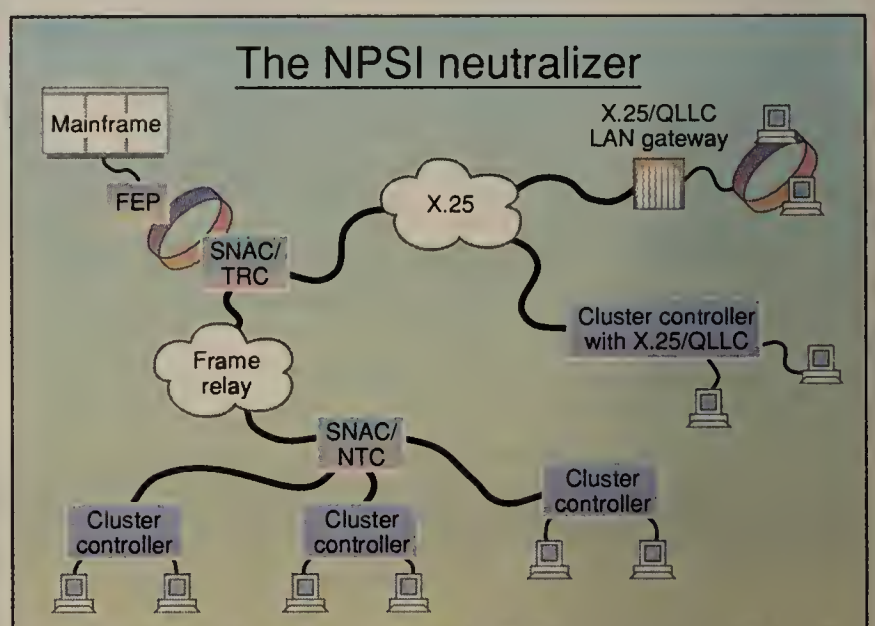
Additionally, Sync Research announced the SNAC/Network Concentrator (NTC), which is used at remote locations to concentrate traffic from SDLC devices onto frame relay or, using IBM's Qualified Logical Link Control (QLLC) data link protocol, X.25 lines.

The SNAC/TRC will work only with the SNAC/NTC in frame relay implementations but will work with any QLLC-compatible device over X.25 lines, Nye said.

Both SNAC products are based on the same hardware platform, a four-slot device that holds two-port V.35 boards or four-port RS-232 boards. Each V.35 board can support either two 64K bit/sec links or a single 128K bit/sec line. Each RS-232 board supports as many as four links running at up to 19.2K bit/sec each.

The SNAC/TRC supports as many as 60 virtual circuits, each of which can be used to support a single cluster controller.

The SNAC/NTC is also scheduled to be available next quarter. It is priced from $7,480, including one RS-232 or V.35 board.



Modem turns PCs into nodes

continued from page 2

link to another LanFast modem to support simultaneous dial-in and dial-out on the same LAN.

Alternatively, the RS-232 port can be used to link the modem to a device that supports digital services, such as an Integrated Services Digital Network terminal adapter or a data service unit/channel service unit that supports high-speed switched digital or dedicated digital links.

Future versions of LanFast will include integral switched digital and ISDN adapter cards. The first version is due in April, and by May, the firm expects to deliver a version for token-ring LANs, Schlosser said. NetWare is the only LAN operating system that UDS intends to support now.

LanFast is compatible with any PC communications package that supports the DOS communications interrupt 14 or NetWare Asynchronous Services Interface redirectors, such as Datastorm Technologies, Inc.'s Procomm Plus Network and Crosstalk Communications/Digital Communications Associates, Inc.'s Crosstalk Mk.4.

Curtis Price, data communications market analyst at International Data Corp., a research firm in Framingham, Mass., said the potential market for LanFast is large and growing fast. The market for asynchronous communications products in 1991 was about $53 million and is expected to grow to $300 million by 1995.

"We're starting to see a lot of modem vendors looking to this area," Price said. Companies such as Telebit Corp., Shiva Corp. and U.S. Robotics, Inc. all have competitive products.

"This is an area that shows great promise, and I think you'll start to see a lot more vendors get into this market," he said.

Compaq to air SystemPros

continued from page 1

offer users improved response times and higher availability than existing low-end SystemPro models. These units will differ from existing SystemPro/LT units because they will come with a 32-bit disk array subsystem that consists of two high-capacity drives running in parallel.

SystemPro models

The vendor will offer two SystemPro/LT IDA Model 680s — one based on a 33-MHz Intel Corp. 80386 microprocessor and the other based on a 25-MHz 486SX chip. Both come with 4M bytes of standard memory and two 340M-byte fixed disk drives for 680M bytes of storage in each unit.

Compaq will also offer the SystemPro/LT IDA Model 1020, which is based on a 33-MHz 80486 microprocessor. It features 8M bytes of standard memory and a pair of 510M-byte drives running in parallel for a total disk storage of 1G byte.

Performance gains from the new IDA models will be most obvious when two or more users are requesting information simultaneously, Schrock said. With the new models, additional data requests are split between the two drives — both of which have the same information — as opposed to all requests competing for the same drive.

Before this release, the IDA subsystem only came standard on high-end SystemPro models, not on the LT models.

Pricing for the SystemPro/LT IDA models varies according to model: The 33-MHz 80386 Model 680 costs $8,399, the 25-MHz 486SX-based model is priced at $9,499, and the Model 1020 costs $12,399.

In contrast, the lowest price disk array controller version of a product comparable to Compaq's starts at $11,000, Schrock said. According to analysts, Compaq's pricing is as much as 50% below that of comparable machines from companies such as IBM and AST Research, Inc.

Compaq will also announce two new low-end single-drive models — the SystemPro/LT Model 210 and Model 510. Both are based on 33-MHz 80386 microprocessors and offer 4M bytes of memory and 210M bytes and 510M bytes of disk storage, respectively. They offer better performance than Compaq's 25-MHz 80386 unit.

The Model 210 costs $4,999, and the Model 510 costs $6,799. Schrock said SystemPro/LT pricing starts at $6,000.

"It looks as though Compaq is really serious about its new strategy to be price competitive while still offering high-performance machines," said Cheryl Currid, president of Currid & Co., a Houston consultancy.

Fully configured servers will help small organizations that do not have technical administrators and will help larger shops simply by eliminating the time it takes to do the installation.

Peter Kastner, vice-president at Aberdeen Group, Inc., based in Boston, agreed. "I think you'll see more and more machines sold with network operating systems," he said.

Pressure on FCC to set standards

continued from page 4

FCC meeting.

Sikes said he is hopeful the industry will be able to work out reliability problems on its own. "It is my hope that the FCC's obligation [to ensure network reliability] can be met, not by telling you what to do and how to do it, but by helping ensure that providers and users are confronting and resolving problems," he said.

Sikes added he envisions that the FCC would publish benchmarks, or best practices, and expect carriers to aim for those levels of performance. "If you found a significant difference between the best and the rest of the carriers, then the FCC might choose to intervene," he said.

Firms reengineer processes

continued from page 4

accounting and finance (40%), marketing and sales (38%), manufacturing and operations (35%) and systems development (32.5%).

Continental Bank Corp., for example, is using reengineering techniques within IS to improve the process of developing new applications. The bank is expecting its efforts to cut in half the time it takes to develop customer applications.

While many large companies are spending substantial sums of money on business reengineering projects, almost a quarter of them reported that their projects were unsuccessful. About 21% of the respondents said their reengineering projects were not very successful, while 2.5% said their projects were unsuccessful.

The survey gave some clues about the problems that can torpedo these types of projects. Almost a third (31.5%) of the respondents ranked managing the process of change as the biggest obstacle, and 21% mentioned maintaining effective communications with staff and customers.

Other obstacles noted include defining objectives (8%), existing thinking (6.5%) and implementation problems (4%).

AT&T digs in on Tariff 12 issue

continued from page 4

riers to sell service to anyone wanting it.

AT&T claims that adding a $1.1 million installation charge for new customers ensures that it will not lose money if customers drop the deal before three years.

However, critics question why the installation charge is 10 times higher than the total of the loss AT&T expects for the first year of the deal. Critics, many of whom are resellers, claim that AT&T is really trying to make the deal so unattractive that resellers will not want it.

AT&T answered those charges in its filing, asking the FCC to reconsider its rejection of the installation charge. The carrier said costs have changed since the initial filing of Option 58 about 17 months ago.

"Characteristics [of new customers] differed markedly from those of the initial customer and were projected to result in higher costs," AT&T stated. "Even the proposed new charges do not protect AT&T from loss in a worst case scenario but are essential [in order] to provide some protection, given the increased financial risk to AT&T under fresh look."

Lotus airs plan to upgrade Notes

continued from page 2

management as a mandatory component," said Peter Aberdeen, vice-president of Aberdeen Group, Inc., an information technology consultancy and market research firm in Boston. "If Lotus can deliver [work flow on Notes] in 1992, it will have a major leg up on its competitors."

Notes is local-area network-based software that supports group messaging, database, spreadsheet and word processing applications.

Lotus is planning to integrate three of Action Technologies' work flow software packages into Notes, said Thomas White, president of Action Technologies, a $7 million, privately held software vendor in Alameda, Calif. One is the Workflow Management System, software that controls the distribution of documents and messages.

Lotus is also eyeing the Workflow Reporter, which enables users to monitor, in real-time, the status of documents being used in a work flow application. Additionally, the firm is considering the Workflow Map Designer, a software tool that automates work flow application design.

Olson said these technologies would make it easier for Notes users to build work flow systems.

Users must now do extensive programming in C language in order for Notes to automatically route messages to individuals at preset times or after certain events. The Workflow Management System would make these capabilities a standard feature of Notes.

Notes users could employ the Workflow Map Designer to create graphical representations of business processes to be automated in a work flow application, Olson explained. This could be used to automatically build a work flow application that distributes information in the manner defined in the graphical representation.

However, Olson cautioned that Lotus has not yet decided which of Action Technologies' work flow technologies will be built into Notes. These details will be finalized during trials with about a half-dozen customers.

Len Yencharis, proprietor of Yencharis Consulting Group in Massapequa, N.Y., said Lotus needs to meet, or beat, this delivery date in order to be a strong player in the work flow marketplace. Several vendors, including Da Vinci Systems Corp., Digital Equipment Corp., Microsoft Corp. and Reach Software Corp., are aggressively developing and promoting work flow automation tools.

Additionally, an industry source who requested anonymity said IBM has acquired Action Technologies' work flow tools and is currently investigating ways to use the technology in work flow applications.

Senior Editor Bob Brown contributed to this story.

Start-up intros X.400 mail, EDI products

continued from page 4

via ISOPLEX messaging engines.

ISOPLEX 800 comes complete with X.400 Message Store, which is a high-capacity buffer to hold messages for retrieval. This is a feature of the 1988 version of X.400, but not of the 1984 release.

ISOCOR is reselling Retix OpenServer software under a private label as its 1984 X.400 mail engine, which is dubbed the ISOPLEX 400.

The ISOPLEX 800 for the RS/6000 will be priced between $10,000 and $20,000, based on configuration of the server and the number of users supported. ISOMAIL 800 user agent software will sell for between $50 and $150 based on quantity.

ISOCOR also rolled out ISOTRADE 800 and 400, EDI software that runs on top of ISOPLEX 800 and 400, respectively. Complementary application program interface software resides on client workstations. The products conform to X.435, the CCITT X.400 protocol standard for transporting EDI messages across X.400 nets.

According to De Mari, EDI will be the driving force behind X.400 acceptance. ISOTRADE will be priced from $1,000 to $3,500, depending on whether it runs on a DOS or Unix platform.

ISOCOR is rounding out its first set of product introductions with new security software dubbed ISOSEC, which will reside on client workstations under DOS (and eventually Unix) to provide several features, such as encryption, digital signatures and receipt acknowledgments. This would be useful for purchasing managers who need to sign major purchase orders electronically, for example, De Mari said.

"Security is really the prime motivator to have an '88 engine rather than an '84," he said. "The '88 supports a number of security features for authentication, data integrity" and acknowledgments.

ISOSEC 800 software will cost between $2,000 and $10,000, depending on the security features chosen.

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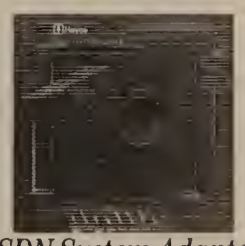
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